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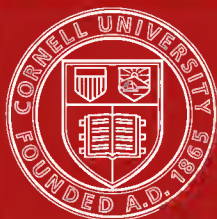
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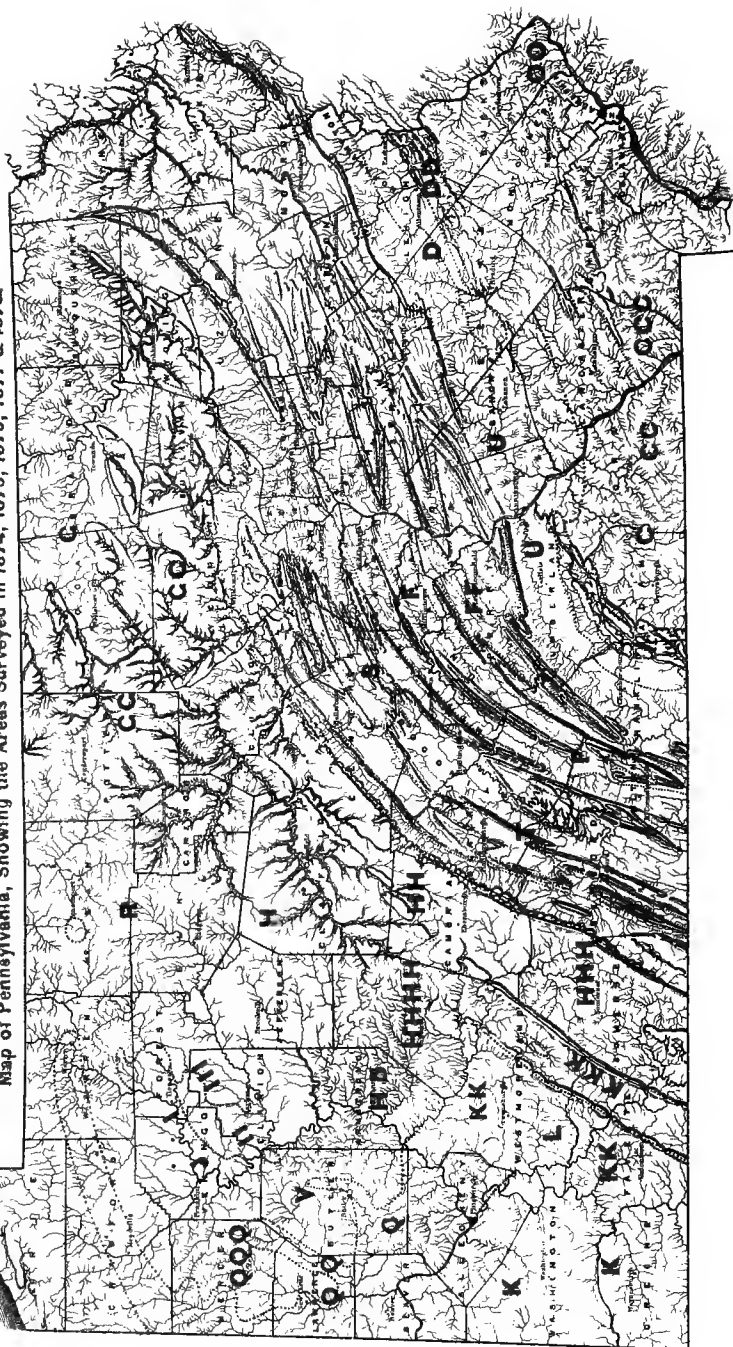


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Map of Pennsylvania, Showing the Areas Surveyed in 1874, 1875, 1876, 1877 & 1878.



SECOND GEOLOGICAL SURVEY OF PENNSYLVANIA:
1875-6-7.

REPORT OF PROGRESS.

N.

TWO HUNDRED TABLES
OF
ELEVATION ABOVE TIDE-LEVEL

OF THE

RAILROAD STATIONS, SUMMITS AND TUNNELS:
CANAL LOCKS AND DAMS, RIVER RIFFLES, &c.

IN AND AROUND

PENNSYLVANIA,

INCLUDING A NUMBER OF

TURNPIKE STATIONS, MILE-POSTS, TAVERN STANDS, CHURCHES, COURT-
HOUSES, DWELLINGS AND MILLS; COAL MINES, IRON BANKS, AND
OIL WELLS; MOUNTAIN KNOBS, CRESTS, NOTCHES AND
GAPS; HILL-TOPS, WATER-SHEDS AND FORKS
OF STREAMS; AND A SELECTION FROM
THE SEABOARD PIPE LINE
SURVEY STATIONS.

BY

CHARLES ALLEN.

WITH A MAP.

HARRISBURG:
PUBLISHED BY THE BOARD OF COMMISSIONERS
FOR THE SECOND GEOLOGICAL SURVEY.

1878.



A. 1015^{kw}

Entered, for the Commonwealth of Pennsylvania, in the year 1877, according
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HARRISBURG, PA., *January 1, 1878.*

Professor J. P. LESLEY, *State Geologist:*

DEAR SIR: I have the honor to submit herewith my report of Railroad, Canal, and other levels of Pennsylvania and portions of New York, New Jersey, Delaware, Maryland, and Ohio. In collecting the information herein contained I consider myself under many obligations to Officers and Engineers of the various RR. lines for their courtesy and kind assistance. I hope it will not be considered an invidious preference by any gentleman who has rendered me assistance when I make mention of persons who have been conspicuous in furthering the work which has been intrusted to me. I shall, therefore, name the following gentlemen to whom I wish to make grateful acknowledgments: Mr. A. J. Cassatt, Vice President Pennsylvania RR., for transportation; Mr. W. H. Wilson, Consulting Engineer, Pennsylvania RR.; Mr. John A. Wilson, Civil Engineer, 410 Walnut street, Philadelphia; Mr. W. Lorenz, Chief Engineer, Philadelphia and Reading RR.; Mr. S. W. Roberts, Chief Engineer, and Mr. A. R. Roberts, Assistant Engineer, North Pennsylvania RR.; Mr. Robert H. Sayre, Chief Engineer, and Mr. A. W. Stedman, Assistant Engineer, Lehigh Valley RR.; Mr. Edwin F. Smith, Chief Engineer, Schuylkill Canal; Mr. J. N. Bolling, Engineer, Baltimore and Ohio RR.; Mr. F. Slataper, Chief Engineer, Pittsburgh, Fort Wayne and Chicago RR.; Mr. C. Latimer, Chief Engineer, and Mr. C. D. Allis, Assistant Engineer, Atlantic and Great Western RR.; Mr. J. D. Hawks, Engineer, L. S. & M. S. RR.; Mr. John F. Carll, Mr. Charles W. Ames, and Mr. Charles A. Ashburner, of the Geological Survey Corps; and to Mr. Charles H. Fisher, Chief Engineer, N. Y. Central RR. I cannot close this list of names, without returning to you my sincere thanks for your uniform kindness and consideration; also, for your counsel and assistance in every stage of the work, and for preparing the indexes, without which the report would be very incomplete.

With great respect,

Your obedient servant,

CHARLES ALLEN.



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PREFACE TO N.

The volume now published, by order of the Board of Commissioners of the Second Geological Survey of Pennsylvania, is designed primarily for the use of the Geologists of the Survey, to afford them datum-points from which to calculate the height and thickness of rock formations, the true strike and dip of mineral beds and veins, and to construct maps and sections in their respective districts.

In designing and executing so slow, laborious and expensive a work, the fact has not been overlooked that it must necessarily be valuable to civil engineers; and also in a subordinate, but not less real sense, to county surveyors and tourists.

The need of such a *Vade mecum* to the geological survey was recognized at the outset, and Mr. Charles Allen, of Harrisburg, was detailed from Professor Frazer's party in York county, in 1875, to give his undivided attention to its preparation. He alone can adequately describe the tedious delays and difficulties encountered in its execution. Every railroad and canal office had to be visited, and in some cases several times. Every profile which could be heard of and referred to had to be examined, remeasured, compared, and copied. Every chief engineer and assistant engineer within present reach had to be seen and corresponded with repeatedly. Promises of corrected records could not always be immediately fulfilled. Promises of relevelings of lines, or portions of lines proved or suspected to be erroneous, could only be realized at the convenience of the railroad companies. Several important roads had no record of levels extant, or only possessed fragmentary lists of determinations at certain points. Preliminary levels would not agree with actual grade levels, and that because final location lines had been shifted sideways, lifted or lowered. The original bench-marks could not be identified or had disappeared. Bridge piers had been raised or dropped, and bench-marks with them. Where two roads crossed each other, grade was often

found to be changed on both roads. Records of levels at railway stations were sometimes vitiated by the shifting of station-houses along the line, without record of direction or distance. Personal inspection of the locality, and personal collection of local traditions, with personal remeasurement from known points or recovered bench-marks, could alone bring order and harmony out of what was in the beginning a mass of confusion.

Some interest, but not enough, was taken in the early stages of the work by civil engineers and railway directors. To make this interest general, and to show how imperfect and erroneous were the records of our railway system, so that the *amour propre* of the profession might be piqued to earnest efforts to rectify the multitude of inconsistencies, and fill out the equally numerous gaps in the series, the Board permitted me to publish a preliminary set of 160 tables as a memoir, which was read at a meeting, January 15 1876, of the American Philosophical Society and published in its proceedings, and to distribute several hundred copies in duplicate to civil engineers.

The effect of this publication was of the most gratifying character. Many of the duplicate copies were returned with important corrections and suggestions, and a large correspondence by mail was inaugurated and kept up from that time to the present between Mr. Allen and a large number of intelligent and influential men in the profession. Additional facilities were granted him by consulting the official records; time and pains were expended by men notoriously overworked, in recovering lost plans, profiles, and notes; private field notes were studied by those who had taken them years ago in their younger days; and new levelings of wanting lines and changed lines were ordered by chief engineers, and gradually executed by assistants in charge of divisions.

The present volume will indicate all this by the notes appended to its tables, but cannot exhibit the extent of the obligations under which so many voluntarily placed themselves and the survey; nor the extent of the trouble they took to aid in this work of such general and professional interest to them all.

A second memoir was prepared, for his own geological purposes, by Mr. John F. Carll, assistant in charge of the survey of the Oil Regions, and accepted and published by the American Philosophical Society, under date of May 4, 1877. This was subsequently republished as Chapter xxvi, of his Report of Progress II, Oil Well Records.

In this memoir Mr. Carll discusses the inconsistencies of all the tables of railroad lines between Pittsburgh, Erie, Buffalo, and Williamsport, and suggests the cause and amount of error in each case. The errors were traced to two principal sources, the fragmentary levelings along the two old main lines of the Philadelphia and Erie, and Alleghany Valley Railways. As it was quite indispensable for the successful study of the underground structure of the Oil Region that correct datum-points along the Alleghany Valley should be at hand, the first consequence of Mr. Carll's discussion was the commission of Mr. John H. Carll to level, with Mr. H. M. Chance, the Butler Branch R.R., and to connect with it the various floating datum-points at Freeport and elsewhere, in Pittsburgh, and along the Alleghany Valley as far up as Oil City. By this the originally correct levels along the Bennett's Branch Extension Railway, over to Driftwood, were reduced to their proper relationship to tide; and the residue of error was concentrated along the Philadelphia and Erie R.R. between Driftwood and Warren.

This residue of error cannot be considered as yet satisfactorily composed, although the limit of error has been narrowly restricted. It affects, however, all the connecting lines into middle New York. Mr. Ashburner's extensive system of personal and contributed levels in McKean county, when carried to completion in 1878, will probably eliminate the last serious errors of our railway system.

Another important piece of work was undertaken by Mr. Allen along the central waters of the State. With the conscientious and skillful assistance of Mr. Charles W. Ames, the true relations of levels along the main Susquehanna and both its branches, from Columbia in Lancaster county, to Queen's Run in Clinton county, and Scranton in Luzerne county, were established between the Northern Central, Philadelphia and Erie, Lackawanna and Bloomsburg, Catawissa, and other railway tracks on the one hand, and the locks and dams of the State canals on the other, and fixed as permanent bench-marks for the future, irrespective of possible changes of railway grade.

In making up the volume without longer delay, the tables of this volume have been grouped geographically as far as possible, and numbered consecutively from 1 to 205.

The *first grouping* is based upon the continuous run of the Pennsylvania R.R. along the middle longitudinal (E. and W.) line of the State. The branches of this road are taken up in the success-

ion of their junctions with the main line from east to west,—with the exception of the Frederick Branch in York and Adams county, which fell into the group of the Northern Central by the accident of its lateness in the collection, and the Mount Union extension of the S. W. Pa. R.R. in Fayette county, for the same reason.

The *Second Group* includes the Reading R.R. and its numerous branches. It is to be regretted that *all points* on all the coal mine tracks, as well as main tracks, could not be obtained and published in this volume. I hope that the Engineers of this important *riseau* of level lines will assume the labor of organizing into tables the whole body of hypsometric data in their possession, for publication in a second edition of this report.

The *Third Group* is that of the North Pennsylvania railroad, and its connections along the Lehigh River.

The *Fourth Group* embraces the Philadelphia and Trenton R.R., with its connecting lines along the Delaware River, and across the north-eastern quarter of the State.

The *Fourth Group* includes also the New York and Erie R.R., with its branches into Pennsylvania.

The *Fifth Group* is that of the New York Central R.R. system, imperfectly represented for lack of time to collect the materials, and only given in comparison with the levels of the northern counties of our State for geological reasons. No doubt the new Topographical Survey of the State of New York will publish its own volume of levels as complete as it will be accurate.

The *Sixth Group* is that of the Susquehanna River, or Northern Central Railroad main line and branches, with compared canal and river levels.

The *Seventh Group* is that of the southern lines from Philadelphia via Wilmington in Delaware, Baltimore, Washington (D. C.) and Cumberland, to Wheeling, and Pittsburgh on the Ohio River, with the connecting lines in the southern counties of Pennsylvania, and turnpike and coal mine levels so far as they were obtainable without too much expense of time and means.

The *Eighth group* is that of the Allegheny Valley R.R. and its numerous northern connections with western New York State, through the oil region.

A very large number of levels, taken in connection with this group of railway lines, have already been published in Mr. J. F. Carll's Report of Progress, I.I. Oil Well Records, and need not therefore be republished in this volume. They are levels of ob-

jects and places, mouths of oil wells, hill summits, water crossings, &c., over extensive areas of north-western Pennsylvania. The Index to I.I. occupies 36 pages, and gives references to about 1,700 points.

The *Ninth Group* embraces the main line down the Ohio River, and its connections throughout the westernmost counties of this State and the easternmost counties of the State of Ohio.

That a collection like this, made with the most scrupulous care, must have errors in it no one can doubt. Nor will the most sedulous proof reading prevent a certain number of additional typographical blunders in the printed edition. The detection of every such inaccuracy is desirable, and information of it will be thankfully received from any source. But all who use this volume may rest assured that its preparation has in no sense been slighted, and the guarantee of that fact will be deemed sufficient by any one who reflects that it has not been prepared for any personal or financial purpose, but with the sole intent of affording a strictly scientific basis of measurement to the geologists of the Survey.

An extensive series of hypsometric data is yet to be arranged and published at a future time; I mean the *barometric* lines run, and altitudes measured, by each geologist in his own district. These are all referable to levels determined at points along the base lines published in this volume.

In this future series, however, need not be included innumerable stations in Sinking, Canoe, and Morrison Cove Valleys in Blair county, and on the surrounding mountains—along Jack's Mountain, Sideling Hill, East Broad Top, Standing Stone, Tussy, Seven Mountains, Buffalo Mountains, White Deer, Bald Eagle, and Nittany Mountains—over the whole *massif* of the South Mountains, in Franklin, Cumberland, York, and Adams Cos.,—over the whole *massif* of the Durham Hills and Reading Hills, and along the limestone valley of Northampton, Lehigh, and Berks Cos.,—because these districts are being mapped on a scale of two thousand feet to an inch (2,000':1''), in contour curves of twenty feet (20') interval, each fifth curve being marked with its elevation above tide. These maps are being rapidly prepared on stone for publication, in separate sheets, and no general tables of elevations will be required, because a simple scale measurement by hand will suffice to give (with close approximation to the truth) the elevation of any point within their respective margins. Special tables will be given, however, of the observed levels of notable places.

The three spirits which preside over modern work, the Gabriel, Raphael and Uriel of Science, are precise observation, clearness of statement, and many sided comparison of data; and the only hostile angel recognized by science is distortion—distortion in observation, and distortion in representation. In geology false measurement, or even the combination of various scales in one representation, renders truth impossible. But even where there is no contrariety but only complexity of datum-points, there ensues an increase of labor, a loss of time, and a waste of brain power.

The preparation of this volume was felt to be a necessity at the first attempt to generalize on references to datum-points, which were generally different in the different geological districts, although their mutual relationships were sometimes known. It will save much labor, because all its localities are referred to *Mean Ocean Level*, as explained in notes to tables 1, 58, &c.

The first column of any table contains the original data wherever and from whomsoever obtained, unchanged, so that the authority for the table may be plain. Sometimes two original records are contrasted in two columns.

The second (or third) column gives the *height, above tide, in feet to the nearest unit*, of each station named in the table, after all corrections have been made.

The *American foot* is the unit of measurement. Those who wish to substitute the *French meter* for it can do so, at their own cost, on the margin of the page.

A final column of *distances, in American miles*, of the respective stations from the official depot of the railway, will be found appended to many of the tables.

An Index of every station named in the book will be found at the end. The references in the Index are *not to the folio of the page*, but to the *number of the table*. But as Table 57 begins on page 57, Table 72 on page 72, Table 93 on page 93, &c., the tabulation falling behind the folio not until Table 116 is reached, and never much, the reader will find this method of reference (compelled by circumstances not needful to recount) very nearly as convenient as the other.

A map has been prepared by Mr. Bien, on the basis of the U. S. Postal sheets, on which the *numbers of the Tables* are printed in *red* on the respective lines of railway, &c. Some idea may be obtained from this map how vastly our work could be enlarged and extended beyond its present limits.

To the following Presidents, Secretaries, Treasurers, Superintendents, General and Division Engineers, and other official persons we owe the data now published.

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To other gentlemen, not mentioned in the above list, thanks are due for personal courtesies received by Mr. Allen in the course of his work.

J. P. LESLEY.

HEAD-QUARTERS 1008 CLINTON ST.,
PHILADELPHIA, *March 1, 1878.*

TABLES

OF

RAILROAD AND OTHER LEVELS

IN AND AROUND

PENNSYLVANIA

REFERRED TO TIDE.

TABLE 1.
PENNSYLVANIA RR.

| STATIONS. | High tide Philad'a. | Above mean level Atlan- tic Ocean. | Distance from Phil. |
|---|------------------------|--|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Philadelphia, Market Street, . . . | 25 | 32 | 0 |
| West Philadelphia, | 27 | 34 | |
| Powelton Avenue, | 38 | 45 | |
| Fairmount Bridge, | 44 | 51 | |
| Mantua, | 94 | 101 | 2 |
| Belmont Avenue, | 103 | 110 | |
| Hestonville, | 136 | 143 | |
| City Avenue, | 214 | 221 | |
| Merion, | 240 | 247 | 5 |
| Elm, | 278 | 285 | 5½ |
| Wynnewood, | 308 | 315 | 6 |
| Ardmore, | 352 | 359 | 7 |
| Bryn Mawr, | 409 | 416 | 9 |
| Rosemont, | 388 | 395 | 10½ |
| Villa Nova, | 423 | 430 | 11 |
| Upton, | 423 | 430 | |
| Radnor, | 402 | 409 | 12 |
| Edgewood Avenue, | 394 | 401 | |
| Wayne, | 398 | 405 | 14 |
| Reeseville, | 488 | 495 | 16½ |
| Paoli, | 527 | 534 | 19 |
| Green Tree, | 536 | 543 | |
| Summit, | 543 | 550 | |
| Malvern, | 539 | 546 | 21 |
| Fraser, | 483 | 490 | |
| Glenloch, | 446 | 453 | 25 |
| Ship Bridge, | 404 | 411 | |
| Walkertown, | 381 | 388 | |
| <i>Intersection of Waynesburg Branch.</i> | | | |
| <i>See Table 2,</i> | 249 | 256 | |

| | | | |
|---|-----|-----|----|
| Downingtown, | 259 | 266 | 32 |
| Gallaghersville, | 291 | 298 | 33 |
| Thorndale, | 306 | 313 | 34 |
| Caln, | 352 | 359 | 36 |
| Coatesville, <i>Intersection of Wil-</i> <i>mington and Reading R.R. See</i> <i>Table 41,</i> | 373 | 380 | 38 |
| Midway, | 387 | 394 | 42 |
| Pomeroy, <i>Eastern Intersection of</i> <i>Pennsylvania and Delaware R.R.</i> <i>See Table 3,</i> | 476 | 483 | 42 |
| Pomeroy, <i>Western Intersection,</i> . | 482 | 489 | 42 |
| Parkesburg, | 530 | 537 | 44 |
| Summit, <i>west of Parkesburg,</i> . . | 555 | 562 | |
| Penningtonville, | 493 | 500 | 47 |
| Christiana, | 484 | 491 | 48 |
| Summit, <i>east of Gap Station,</i> . . | 566 | 573 | |
| Gap, | 552 | 559 | 51 |
| Kinzers, | 461 | 468 | 54 |
| Spindlers, | 397 | 404 | |
| Leaman Place, | 375 | 382 | 57 |
| Gordonville, | 378 | 385 | 58 |
| Fairview, | 378 | 385 | |
| Bird-in-Hand, | 352 | 359 | 61 |
| Lancaster, <i>Bench Mark on Stone</i> <i>Wall, Lancaster Locomotive</i> <i>Works, $340 + 7 = 347,$</i> | 352 | 359 | 69 |
| Dillerville Junction, <i>Junction</i> <i>of Columbia Branch, at</i> <i>Dillerville,</i> | 352 | 359 | 70 |
| Roherstown, <i>On Columbia</i> <i>Branch,</i> | 345 | 352 | 72 |
| Summit, | 416 | 423 | |
| Mountville, | 397 | 404 | 76 |
| Columbia, <i>See Susquehanna</i> <i>Canal levels, See Table 111,</i> . . . | 244 | 251 | 81 |
| Chiques, | 248 | 255 | 82 |
| Marietta, | 253 | 260 | 84 |
| Shocks Mill, | 262 | 269 | 87 |
| Bainbridge, | 264 | 271 | 91 |
| Collins, | 278 | 285 | 94 |
| Middletown Junction, <i>Junc-</i> <i>tion of Columbia Branch,</i> <i>at Middletown,</i> | 307 | 314 | 99 |
| Landisville R. & C. R.R., <i>See Table</i> <i>44, Reading and Columbia R.R.</i> <i>Crossing, at Landisville,</i> | 398 | 405 | 76 |
| Salunga, | 396 | 403 | 77 |
| Chiques Bridge, | 344 | 351 | |

Columbia Line.

| | | | |
|---|-----|-----|-------|
| Mount Joy, <i>East side of R.R. Hotel,</i> | 359 | 366 | 80 |
| Springville, | 383 | 390 | 82 |
| Rheems, | 432 | 439 | 85 |
| Tunnel, | 472 | 479 | |
| Elizabethtown, | 450 | 457 | 87 |
| Summit, | 493 | 500 | |
| Conewago, | 422 | 429 | 91 |
| Middletown, | 307 | 314 | 96 |
| Highspire, | 293 | 300 | 99 |
| Harrisburg, <i>West line of depot \$13.91</i> | | | |
| <i>+7 = \$20.91. Curb stone at</i> | | | |
| <i>lamp post U. S. Hotel \$13.54 +</i> | | | |
| <i>7 = \$20.54. West line of Lebanon</i> | | | |
| <i>Valley Depot \$15.5 +7 = \$22.5.</i> | | | |
| <i>West line of State street \$19.2 +</i> | | | |
| <i>7 = \$26.2,</i> | 313 | 320 | 105 |
| Susquehanna, | 335 | 342 | 109 |
| Susquehanna Bridge, | 343 | 350 | 110 |
| Marysville, | 343 | 350 | 113 |
| N.C.R.R. Crossing, <i>See Tab. 109-110,</i> | | | |
| <i>Northern Central R.R. Crossing,</i> | 342 | 349 | 113 |
| Duncannon, | 349 | 356 | 120 |
| Aqueduct, | 370 | 377 | |
| Bailys, | 380 | 387 | 128 |
| Newport, | 388 | 395 | 133 |
| Millerstown, | 401 | 408 | 138 |
| Thompstontown, | 412 | 419 | 143 |
| Tuscarora, <i>Bench Mark on top of</i> | | | |
| <i>Stone foundation west corner of</i> | | | |
| <i>Water Station 424.44,</i> | 422 | 429 | 148 |
| Mexico, | 426 | 433 | 149.5 |
| Perryville, | 434 | 441 | 151 |
| Mifflin, | 434 | 441 | 154 |
| Black Log, | 455 | 462 | |
| Bixlers, | 475 | 482 | |
| Lewistown, | 491 | 498 | 166 |
| M. & C. C. R.R. Crossing, <i>See Ta-</i> | | | |
| <i>ble 6, Junction of Mifflin and</i> | | | |
| <i>Centre County R.R.,</i> | 492 | 499 | |
| Granville, | 491 | 498 | 170 |
| Anderson's, | 493 | 500 | 171.5 |
| Anderson's, Water Station, | 492 | 499 | |
| McVeytown, | 515 | 522 | 173 |
| Manayunk, | 512 | 519 | 183 |
| Vineyard, | 541 | 548 | 185 |
| Newton Hamilton, | 592 | 599 | 188 |
| Mount Union, E. B. T., <i>See Table 8.</i> | | | |
| <i>Junction of East Broad Top R.R.</i> | | | |
| <i>(narrow gauge),</i> | 590 | 597 | 191 |

| | | | |
|---|------|------|-------|
| Jackstown, | 588 | 595 | |
| Mapleton, | 586 | 593 | 194 |
| Mill Creek, | 597 | 604 | 198 |
| Huntingdon, H. & B. T., <i>See Table 9.</i> | | | |
| <i>West line of ticket office, crossing</i> | | | |
| <i>south track west to Huntingdon</i> | | | |
| <i>and Broad Top R. 613.9 + 7 =</i> | | | |
| <i>620.9,</i> | 615 | 622 | 203 |
| Warrior Ridge, | 670 | 677 | |
| Petersburg, | 671 | 678 | 209 |
| Shuman's Bridge, <i>Bench Mark on</i> | | | |
| <i>west end of bridge,</i> | 692 | 699 | |
| Barre Forge, | 717 | 724 | 212 |
| Tunnell, <i>West end of Spruce Creek</i> | | | |
| <i>Tunnel,</i> | 754 | 761 | |
| Spruce Creek, | 770 | 777 | 215 |
| Union Furnace, | 792 | 799 | 216 |
| Birmingham, | 859 | 866 | 220 |
| Tyrone Water Station, | 889 | 896 | 222 |
| Tyrone RR., <i>See Tables 14, 15, 16,</i> | 900 | 907 | 223 |
| Tipton, | 983 | 990 | 226 |
| Fostoria, | 1022 | 1029 | 228.5 |
| Bells Mills RR., <i>Table 19,</i> | 1053 | 1060 | 230 |
| Elizabeth Furnace, | 1072 | 1079 | 232.5 |
| Blair Furnace, | 1107 | 1114 | 234 |
| Altoona RR., <i>Tables 20, 24, West</i> | | | |
| <i>line of ticket office 1171 + 7 =</i> | | | |
| <i>1178. B.M. (Bench Mark) south-</i> | | | |
| <i>west corner, top step front door of</i> | | | |
| <i>ticket office 1174 + 7 = 1181, . .</i> | 1171 | 1178 | 237 |
| Kittanning, | 1587 | 1594 | 242 |
| Murdocks, | 1619 | 1626 | |
| Alligrippus, | 1913 | 1920 | |
| Bennington Furnace, | 2031 | 2038 | |
| Tunnel, <i>B. M. at east end of Tun-</i> | | | |
| <i>nel, on rough part of first course</i> | | | |
| <i>of stone above foundation, . . .</i> | 2119 | 2126 | |
| Gallitzin, | 2154 | 2161 | 249 |
| Cresson, E. & C. RR., <i>See Tab. 25,</i> | | | |
| <i>Switch to Ebensburg and Cresson</i> | | | |
| <i>RR. 2021 + 7 = 2028,</i> | 2010 | 2017 | 252 |
| Lillys, | 1880 | 1887 | 255 |
| Portage, | 1668 | 1675 | 259.5 |
| Wilmore, | 1550 | 1557 | 262 |
| Summit, <i>Pringles point,</i> | 1562 | 1569 | |
| Summerhill, | 1550 | 1557 | 264 |
| South Fork, | 1477 | 1485 | 266 |
| Viaduct, <i>Bench Mark on N.W. cor-</i> | | | |
| <i>ner west end of coping,</i> | 1449 | 1456 | 268 |

| | | | |
|--|------|------|-------|
| Mineral Point, | 1407 | 1414 | 269 |
| Conemaugh, | 1218 | 1225 | 273 |
| Johnstown, | 1177 | 1184 | 276 |
| Sang Hollow, | 1136 | 1143 | 279.6 |
| Conemaugh Furnace, | 1128 | 1135 | |
| Nineveh, | 1114 | 1121 | 285 |
| New Florence, | 1069 | 1076 | 289 |
| Houstons, | 1049 | 1056 | 291 |
| Lockport, | 1047 | 1054 | 294 |
| Bolivar, | 1026 | 1033 | 295 |
| Blairsville Junction, <i>Intersection of</i> <i>Blairsville and Indiana Branch</i> <i>of Pa. R.R. with main line, See Ta-</i> <i>ble 26,</i> | 1106 | 1113 | 300 |
| Hillside, | 1122 | 1129 | 304 |
| Millwood, | 1148 | 1155 | 306 |
| Derry, | 1165 | 1172 | 308 |
| Lindorff's Summit, | 1178 | 1185 | |
| St. Clair, } <i>Lig. R.R., See Table 32,</i> { | 1085 | 1092 | 310 |
| Latrobe, } | 999 | 1006 | 313 |
| Beatty's, | 1066 | 1073 | 315 |
| Kearney's, <i>Rogers' Summit 1201.8 +</i> <i>7=1208.3,</i> | 1041 | 1048 | 317 |
| Shanghai, | 1166 | 1173 | |
| Carr's Tunnel, <i>east face of Tunnel,</i> | 1201 | 1208 | |
| George's, | 1189 | 1196 | 319 |
| Greensburg, <i>B. M. east face of</i> <i>Greensburg Tunnel on top of</i> <i>rough part of second course from</i> <i>bottom 'R' 1079.52, 1086.52 Ocean</i> <i>level. S. W. Penn. R.R. Junction,</i> <i>3300 feet east of tunnel elevation,</i> <i>1063 feet above high tide in the</i> <i>Schuylkill river at Philadelphia,</i> <i>and 1070 feet above Ocean,</i> . . | 1084 | 1091 | 323 |
| McGrann's Tunnel, <i>west face of</i> <i>Tunnel,</i> | 1156 | 1163 | |
| Radebaughs, | 1143 | 1150 | 325 |
| Grapeville, | 1052 | 1059 | 326 |
| Penn, | 967 | 974 | 328 |
| Manor, | 935 | 942 | 330 |
| Shafton, | 898 | 905 | 331 |
| Irwin's. Y. R.R. <i>See Table 34,</i> | 877 | 884 | 332 |
| Larimer's, | 859 | 866 | 333 |
| Carpenter's, | 847 | 854 | 335 |
| Stewart's, | 784 | 791 | 337 |
| Wall's, | 744 | 751 | 339 |
| Springhill, | 742 | 749 | |
| Turtle Creek, | 743 | 750 | 341 |

| | | | |
|--|-----|-----|------|
| Oak Hill, | 743 | 750 | |
| Brinton's, | 750 | 757 | 342 |
| Braddock's, | 821 | 828 | 344 |
| Copeland, | 846 | 853 | 344½ |
| Hawkins', | 876 | 883 | 345 |
| Swiss Vale, | 915 | 922 | 346 |
| Edgewood, | 916 | 923 | 346½ |
| Wilkinsburg, | 916 | 923 | 347 |
| Brushton, | 915 | 922 | 347½ |
| Homewood, | 916 | 923 | 348 |
| Torrens, | 913 | 920 | 349 |
| East Liberty, | 911 | 918 | 349½ |
| Roups', | 875 | 882 | 350 |
| Shadyside, | 849 | 856 | 350½ |
| Millvale, | 826 | 833 | 351 |
| Lawrenceville, | 773 | 780 | 352 |
| Pittsburg, <i>west face of Union Passenger Depot, east side of Wayne street</i> $734.5+7=741.5$. <i>East side of Irwin street</i> $729.7+7=736.7$. <i>East side of Duquesne street depot</i> $725.4+7=732$. <i>Bench Mark at foot of lamp post south side of Liberty street, intersection with Water street</i> 721.27 . <i>Bench Mark on south side of base ring, of fire plug, north side of Penn street, intersection with Water street,</i> $719+7=726$, | 738 | 745 | 354 |

THE PENNSYLVANIA RR. SYSTEM.

Pennsylvania Railroad.

NOTE.—The elevations at the various stations, on the Pennsylvania Railroad, were copied from the Engineers' notes, by permission of Mr. W. H. Wilson, its Consulting Engineer.

The datum, or base of levels, is ordinary high-water in Schuylkill river. This datum, according to Mr. James T. Gardener's determination, is 6.913 feet* above mean surface of the Atlantic Ocean. *These 7 feet are added in the second column.* Decimal parts of a foot do not occur in these lists. When below .5 they have been omitted; when more than .5 a whole number has been substituted.

* Permanent U. S. Coast Survey granite bench at Gloucester Ferry, N. J., opposite Philadelphia, is 8.10 above Mean Tide Raritan Bay, or Mean Ocean level. Mean Tide Delaware River=8.10—4.751=3.349. Philadelphia City Surveyor's datum: 8.10+0.632=8.732. Pennsylvania RR. Engineer's datum: 8.732—1.819 High tide, 6.913.

PENNA. RAILROAD OFFICE,
233 SOUTH FOURTH STREET.
PHILADELPHIA, *June 13, 1876.*

CHAS. ALLEN, Esq.:

DEAR SIR:—I have given my personal attention to a comparison of the elevations of the Penna. R.R. main line, and such of its branches as I have the notes of, as noted on our profiles, with those given in the printed tables prepared by you; and I herewith return one of the copies sent to me, with the corrections noted. I regret that I had not been able, previous to your calling upon me for information, to examine our profiles and notes carefully, and put them in proper shape, but I had been for some time previous, and was at the time of your visit, very much occupied with important matters requiring my whole time and attention. Several of the branch road profiles had not been seen by me until borrowed from the Maintenance of Way office, for your use. Most of the errors in your tables have probably been in consequence of the datum lines of the several profiles differing, and the necessity of adding or subtracting some are doubtless owing to the *want of care*. We found a singular mistake on the Mifflin and Centre Co. profile, which you will see explained in the book. I believe the notes, as far as I have examined them, are now correct.

Yours respectfully,

W. H. WILSON, C. E.

TABLE 2.

EAST BRANDYWINE AND WAYNESBURG R.R.

| STATIONS. | High tide, Philad'a. | Ocean Level. | Dist. from Downing- town Ter. |
|---|-------------------------|--------------|-------------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Downingtown Terminus, <i>Junction with north track of the Pa. R.R. near Downingtown. See Table 1.</i> | 249 | 256 | 0 |
| Shelmires, | 239 | 246 | 1 |
| Dowlin's Forge, | 267 | 274 | |
| Dorlan's, | 273 | 280 | 4 |
| Reed's Road, | 302 | 309 | 4½ |
| Brooklyn, | 324 | 331 | 6 |
| Cornog's, | 354 | 361 | 7½ |
| Springton, | 398 | 405 | |
| Moorestown, | 436 | 443 | 9½ |
| Barnestown, | 479 | 486 | 12 |
| Lewis Mills, | 535 | 542 | 13½ |
| Cupola, | 558 | 565 | 14 |
| Forrest, | 569 | 576 | 14½ |
| Dampman's, | 621 | 628 | 15 |

| | | | |
|--|-----|-----|-----|
| W. & R. RR., crossing Wilmington and Reading RR. See Table 41, | 638 | 645 | 16 |
| Buchanan's, | 665 | 672 | 16½ |
| Lancaster Pike, | 689 | 696 | |
| Waynesburg Station, | 721 | 728 | |
| End of Track, | 734 | 741 | 18 |

NOTE.—The levels on the East Brandywine and Waynesburg RR. were furnished by Mr. W. H. Wilson, Consulting Engineer of the Pennsylvania RR.

The datum, or base of levels is ordinary high water in Schuylkill river, Philadelphia. Therefore 7 feet are added in the second column to reduce to mean tide in the Atlantic Ocean.

TABLE 3.
PENNSYLVANIA AND DELAWARE RR.

| STATIONS. | High Tide, Philad'a. | Ocean Level. | Dis. from Pomeroy Junction. |
|--|-------------------------|--------------|-----------------------------------|
| | Feet. | Feet. | Miles. |
| Pomeroy Junction, Junction with Pennsylvania RR. at Pomeroy Station, 42.2 miles west of Philadelphia. See Table 1, | 472.9 | 483 | 0 |
| Doe Run, | 364 | 374 | 6 |
| Pusey's Summit, | 460 | 470 | 10 |
| Pennock's Summit, | 453 | 463 | |
| Avondale, Crossing the Philadelphia and Baltimore Central RR. See Table 139, | 271.6 | 281.6 | 15 |
| Newark, Crossing of the Delaware Railway Line, | 108 | 118 | 26 |
| Delaware RR. Crossing, Crossing of the Philadelphia, Wilmington, and Baltimore RR., | 76.2 | 86.2 | 33 |
| Delaware City, | 6 | 16 | 38 |

NOTE.—The elevations on the Pennsylvania and Delaware Railroad were obtained in the office of Mr. George W. Leuffer, C. E., of Philadelphia.

At Pomeroy Station, 42 miles west of Philadelphia, this road joins the Pennsylvania RR. Mr. Leuffer makes this point 472.9; Mr. Wilson 476 039. To Mr. Leuffer's levels in the first column are therefore added 3 feet to accord with the P. RR. list, and an additional 7 feet to reduce to mean Atlantic tide level.

TABLE 4.

LEVELS IN LANCASTER AND YORK COUNTIES,
along the line of Mr. Hutchinson's Survey.

| STATIONS. | Mean tide. |
|--|--------------|
| | <i>Feet.</i> |
| McClure's Summit, Lancaster county, about 3 miles from Chester county line, | 617 |
| Octoraro Creek, in Valley, (surface of water,) | 533 |
| Summit, between waters of Octoraro Creek and Big Beaver Creek, | 589 |
| Eshelman's Summit, between waters of Big Beaver and Conowingo Creek, | 704 |
| Conowingo Creek, tending across from Eshelman's Summit to Fishing Creek, | 597 |
| Buck Summit, between Fishing Creek and Conowingo, | 654 |
| Hutton's Mill, on Fishing Creek, S. W., | 468 |
| Penrose Mill, on Fishing Creek, S. W., | 355 |
| Murphy's Loop, average elevation, | 190 |
| Pennock's Mill, Fishing Creek, S. W., | 229 |
| Mouth of Fishing Creek, Susquehanna River, | 100 |
| Elevation of Susquehanna River, at Fite's Eddy, 9,000' above mouth of Fishing Creek, | 107 |
| Bottom of River, 185 feet from shore, | 2 |
| Crossing River at Smith's Point, elevation of Island, | 177 |
| Mouth of Muddy Creek, at Canal, York county, surface of water, | 119 |
| Campbell's Run, | 153 |
| Marlin's Run, | 160 |
| Castle Finn, (S. W. Muddy Creek,) | 190 |
| Plett's Run, S. W., | 204 |
| Run near Bryansville, on Muddy Creek, | 210 |
| Mouth of Fishing Creek, | 219 |
| Mouth of Montgomery Run, | 262 |
| Naylor's Run, | 280 |
| Ilginfritz's Farm, mouth of Alexander's Run, S. W., | 303 |
| Donnel's Run, <i>Leave Muddy Creek at this point, and run up Alexander's Run,</i> | 317 |
| Bald Eagle, | 374 |
| Anderson's Mill, surface of water above dam, | 452 |
| Manifold's Run, | 502 |
| Brown's Run, | 593 |
| Irving's Run, | 670 |
| Head waters of Alexander's Run, | 746 |
| Fawn Grove Summit, $\frac{1}{2}$ mile S. W. of Fawn Grove Tavern, | 820 |
| New Park P. O., | 812 |

| | |
|---|-----|
| Strawbridge's, | 806 |
| Head waters of Gilbert's Run, | 765 |
| Surface of water in Deer Creek, where Gilbert's Run empties into same, | 524 |
| Water in Deer Creek, at Gorsuch's Mill, mouth of Bond's Run, | 534 |
| Bond's Summit, Balto. Co., Md., | 767 |

Levels of a survey made by Mr. J. B. Hutchinson, Chief Engineer Columbia and Port Deposit RR., from a point near Penningtonville, on the Pa. RR. The survey runs up Fishing Creek, past the Buck Tavern, and along the Ridge of hills near Quarryville, in Lancaster county, and up Muddy Creek, Alexander's Run, and to the top of the hills near Fawn Grove and Stewartstown, in York county. Datum, Mean Tide, Chesapeake Bay.

TABLE 5.
YORK BRANCH P. RR.

| STATIONS. | High Tide, Philad'a. | Ocean Level. | Dis. from Columbia. |
|---|-------------------------|--------------|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Columbia, <i>Juncton with the Colum- bia Branch of the Pa. RR. See Table 1,</i> | 241.3 | 251.3 | 0 |
| Wrightsville, | 247.5 | 257.5 | 1 |
| Creitz Creek, <i>Bench mark on east end of coping of girder bridge No. 3, over road and Creitz Creek,</i> | 263 | 273 | |
| Hellam, | 338 | 348 | |
| Heistand's, | 427 | 437 | |
| York (N. Central RR.), <i>See Tab. 109,</i> | 369 | 379 | 14 |

The levels on the York Branch of the Pennsylvania RR. were copied from the profile in the office of the P. RR. at Philadelphia.

In accordance with instructions of Mr. W. H. Wilson, 3' was added to each elevation, as shown on the profile, in order to agree with the level of Columbia according to Pa. RR.; and also 7 feet to reduce to mean Ocean level.

TABLE 6.
MIFFLIN AND CENTRE CO. RR.

| STATIONS. | Above tide. | Ocean level. | Dist. from Lewistown. |
|--|--------------|--------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Lewistown Junction, <i>with the Pennsylvania RR. near the Lewistown Station. See Table 1,</i> | 492 | 499 | 0 |
| Logan, | 505 | 512 | 4 |
| Yeagertown, | 527 | 534 | 5 |
| Mann's, | 566 | 573 | 6 |
| Reedsville, | 586 | 593 | 7 |
| Honey Creek, | 640 | 647 | 10 |
| Nagney, | 671 | 678 | 11 |
| Milroy, <i>Terminus in the Kishicoquillis Valley. This survey has been extended through the Seven Mountains to Bellefonte,</i> | 739 | 746 | 13 |

The levels of the Mifflin and Centre Co. Railroad were copied from a profile in the office of the Pennsylvania RR. Co., at Philadelphia, furnished by Mr. W. H. Wilson, Consulting Engineer, Pennsylvania RR.

The datum is that of the Pennsylvania RR., *7 feet added*, to reduce to mean Atlantic level, in the second column.

TABLE 7.
SUNBURY AND LEWISTOWN RR.

| STATIONS. | Ocean Level. |
|---|--------------|
| | <i>Feet.</i> |
| Frog at Junction with N. C. RR., <i>opposite Selinsgrove, east end of RR. bridge,</i> | 438.35 |
| Crossing Susquehanna river, <i>top of south rail,</i> | 438.76 |
| West end of RR. bridge, <i>top of N. rail,</i> | 439.08 |
| Selinsgrove Station, | 440.36 |

The above levels on the Sunbury and Lewistown RR. are copied from the level notes of Mr. Chas. W. Ames' Second Geological Survey of Pennsylvania, May, 1877. Datum, Pennsylvania RR. I have never found any record of the levels of this road, and can find no person who has any positive knowledge that there is a profile of the road in existence. The level will probably be continued from Selinsgrove to Lewistown during the coming summer by some of the Geological Survey Corps.

TABLE 7b. MIFFLIN COUNTY LEVELS.

Along the foot of Jack's Mountain.

| STATIONS. | Ocean level. |
|---|--------------|
| | <i>Feet.</i> |
| <i>Penna. R.R., Lewistown Junction, Lewistown Station,</i> | 498 |
| <i>M. & C. Co. R.R.,</i> | 497.4 |
| <i>Juniata river at Lewistown,</i> | 447 |
| <i>Lewistown and Bellefonte turnpike, first toll-gate from } Lewistown,</i> | 534 |
| <i>Logan furnace, top of stone, (second course,) N. W. } corner,</i> | 510.7 |
| <i>Kishicoquillas creek, at Logan,</i> | 501 |
| <i>First R.R. bridge below Yeagertown, top of floor beams,</i> | 522.72 |
| <i>Road bridge over Kishicoquillas creek, (Logan Gap,)</i> | 576.4 |
| <i>Creek below bridge,</i> | 543 |
| <i>Turnpike, in front of James Mann's residence,</i> | 592 |
| <i>Ferguson valley road, in front of F. Mean's residence,</i> | 568 |
| <i>Ferguson valley road, in front of R. Mean's residence,</i> | 543 |
| <i>Crest of Jack's mountain, opposite R. Mean's,</i> | 1760 |
| <i>Ferguson valley road, in front of Sam'l Myers, (water } shed,)</i> | 747 |
| <i>Mountain road, in front of James Shahan's house,</i> | 938 |
| <i>Crest of Jack's mountain, on road above J. Shahan's,</i> | 1823 |
| <i>Top of gate-post in front of A. McKee's residence,</i> | 729 |
| <i>Junction of Ferguson valley and Hope furnace roads,</i> | 605 |
| <i>Crest of Jack's mountain, on McVeytown mountain } road,</i> | 1894 |
| <i>Ferguson valley road, in front of Dunkard meeting- } house,</i> | 632 |
| <i>McVeytown Station, (P. R.R.,)</i> | 522 |
| <i>Juniata river, at McVeytown,</i> | 476 |
| <i>Top of curb-stone, in front of Gen'l Ross' house,</i> | 524.1 |
| <i>Bottom of Dull & Bradley's sand pit,</i> | 482 |
| <i>Road above sand pit,</i> | 536 |
| <i>McCoy's ore opening,</i> | 677 |
| <i>Ross ore bank, } Upper drift,</i> | 719 |
| <i>Lower drift,</i> | 630 |
| <i>Physic ore opening,</i> | 801 |
| <i>Dull & Bradley's hematite bank, (head of shaft,)</i> | 966 |
| <i>Junction of Kansas road and McVeytown mountain } road,</i> | 687 |
| <i>Junction of Kansas road and Musser's road,</i> | 764 |
| <i>James Rhodes' ore-bank, mouth of drift, (water-shed,)</i> | 1024 |
| <i>Stream in front of J. Rhodes' house,</i> | 959 - |
| <i>Atkinson's mills, (in front of grist-mill,)</i> | 744 |
| <i>Crest of Jack's mountain, opposite Atkinson's mills,</i> | 2212 |
| <i>W. R. McDowell's road, in front of residence,</i> | 612 |

| | |
|--|------|
| Matilda furnace reservoir, | 659 |
| North end of old county bridge, above Mt. Union, . . | 584 |
| Summit of Jack's mountain $1\frac{3}{4}$ miles N., $12^{\circ} 30'$ E. } from old bridge above Mt. Union, } | 2354 |

Line of levels along the South foot of Jack's mountain, from Lewis-town to Mt. Union. Reduced to Atlantic Ocean level, by referring them to datum of Penna. RR. Most of the levels in this table were obtained by means of an engineer's level, by Mr. Chas. A. Ashburner, and can be depended upon as very correct.

TABLE 8.
EAST BROAD TOP NARROW GAUGE RR.

| STATIONS. | Assumed Datum. | Ocean level. | Dist. from Mt. Union. |
|--|-------------------|--------------|--------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Mount Union Junction, <i>East Broad</i> <i>Top RR. connects with Pennsyl-</i> <i>vania RR. at Mount Union, . .</i> | 810.65 | 597 | 0 |
| Morrison's Summit, | 828 | 615 | |
| Aughwick Creek, | 773.60 | 560 | 4 |
| Shirleysburg, | 784.94 | 572 | 7 |
| Douglas Summit, | 811.24 | 598 | |
| McMullen's Summit, | 882.74 | 669 | |
| Rockhill, | 837.62 | 624 | 11 |
| Jordan's Summit, | 922.22 | 709 | |
| Beersville, | | 658 | |
| Scottsville, | 929.85 | 717 | |
| Saltillo, | 994.70 | 781 | 19 |
| Sideling Hill Tunnel, | 1445.47 | 1232 | |
| Cole's Station, | 1572.06 | 1359 | $24\frac{1}{2}$ |
| Cook's Station, | 1754.24 | 1541 | |
| Robertsdale, | 1998.70 | 1785 | 30 |
| End of Road, <i>On the plateau of the</i> <i>Broad Top Mountain in Hunt-</i> <i>ington County,</i> | 2030.02 | 1817 | |

The levels on the East Broad Top RR. (3 foot guage), were copied from a profile in the office of the Company, at Orbisonia, by permission of Mr. A. W. Sims, Superintendent.

The datum of the profile is an assumed elevation, and has been reduced to tide level by reference to the Pennsylvania RR. grade at Mount Union, 590', with 7' added to reduce to mean Atlantic Ocean level.

TABLE 8b.
**AROUND ORBISONIA;
 FOSSIL ORE MINES;
 BETWEEN BLACKLOG AND BROAD TOP;
 AND
 IN THE EAST BROAD TOP COAL BASIN.**

| STATIONS. | Ocean Level. |
|--|--------------|
| | <i>Feet.</i> |
| Rockhill Station, (E. B. R.R.), | 624 |
| Head Race, and Orbison's mill, Orbisonia, | 641 |
| Road in front of Dewees & Co.'s Grist Mill, | 654 |
| Surface of dam in Blacklog creek for D. & Co.'s mill, | 673 |
| Junction of roads, east side of Blacklog gap, | 687 |
| Crest of Blacklog mountain, north of gap, | 1727 |
| Crest of Blacklog mountain, south of gap, | 1584 |
| Junction of Blacklog and Aughwick creeks, | 578 |
| RANGE I, FOSSIL ORE. | |
| <i>Numbers of ore mines refer to similar numbers on the map.</i> | |
| 1. North Fossil, No. 2, | 762 |
| 2. North Fossil, No. 1, | . . . |
| 3. South Fossil, No. 1, | 669 |
| 4. South Fossil, No. 2, | 728 |
| RANGE II, ORISKANY ORE. | |
| 5. Chert Bank, | 782± |
| CORNIFEROUS ORE. | |
| 6. Hawk Mine, | 937 |
| RANGE III, MARCELLUS ORE. | |
| 7. Drift, | 746 |
| 8. Open cut, | 714± |
| 9. Bedford cut, | 709± |
| 10. Orbison slope, | 762 |
| 11. Jordan bank, | 778 |
| 12. Drift, | 788± |
| RANGE IV, MARCELLUS ORE. | |
| 13. Open cut, | 742 |
| 14. " " | 694± |
| 15. " " | 714± |

RANGE V, MARCELLUS ORE.

| | |
|--------------------------------|------|
| 16. Drift, | 941 |
| 17. Drift and slope, | 817 |
| 18. Drift and shaft, | 730 |
| 19. Open cut, | 674± |

RANGE VI, MARCELLUS ORE.

| | |
|---|-------|
| 20. Royer & Dewees' tunnel, | 770 |
| <i>Jordan's Summit</i> (RR.), | 709 |
| Junction of Three Springs creek and Great Aughwick } creek, } | 618 |
| Road in front of Malinda furnace (1011), | 660± |
| <i>The inclosed figures are the field station-numbers of points at which elevations are given. C. E. B.</i> | |
| Summit of Coaling Ridge, | 1110± |
| Beersville (RR.), | 658 |
| Opening on Marcellus ore near T. Fleck's (1147), . . | 882 |
| Road at R. L. Green's (954), | 798 |
| <i>Three Springs</i> (RR.), | 717 |
| Summit of Cave Hill, | 1210± |
| Junction of roads at S. L. Glasgow's (984), | 791 |
| Summit of Jack's mountain, 2½ miles N. from Three } Springs, } | 2220 |
| <i>Saltillo</i> (RR.), | 781 |
| Road in front of G. W. Cohill's (508), | 794 |
| McCarthy's ore bank (Marcellus ore), | 835 |
| Junction of roads S. of E. Walker's (1019), | 925 |
| Summit of Clear ridge, at road crossing (1028), . . | 1300 |
| Clear ridge gap (stream level), | 885 |
| Junction of roads E. of J. B. Morland's (557), . . | 1134 |
| <i>Sideling Hill</i> (center of tunnel) (RR.), | 1232 |
| Summit of Sideling Hill over tunnel (627), | 1360 |
| Summit of Sideling Hill, at road crossing, N. E. from } tunnel (1265), } | 1517 |
| <i>Sideling Hill</i> (center of tunnel) (RR.), as above, . . | 1232 |
| <i>Cole's Station</i> (RR.), | 1359 |
| Bend in road N. E. end of Long's ridge (1364), . . | 1226 |
| Trough creek, at road crossing, below Stapleton's, . | 1200 |
| Summit of Rocky ridge, on road west from Staple- } ton's (1382), } | 1467 |
| Dougherty's old coal opening, 1 mile S. W. from } Stapleton's, } | 1607 |
| Petriken coal bank (Rocky ridge), | 1456 |
| Curfman's (Savage) coal bank (Rocky ridge), . . . | 1531 |
| Surface of dam in Trough creek, between Rocky ridge } and Shirley's knob, } | 1144 |
| Cross-roads near J. Taylor's (1213), | 1213 |
| "Bagdad," bridge over run, | 1136 |

| | |
|---|--------|
| Whitney's limestone quarry (1707), | 1135 |
| Summit, in road between Rocky ridge and Round knob, | 1750 |
| Summit of Round knob (near Cook's station), | 2304 |
| Trough creek, W. end of Wray's hill tunnel, | 1455 |
| Summit Wray's hill, over tunnel, | 1740 |
| Iron knob (just S. of tunnel), | 1860 |
| Summit in road which crosses from Sideling hill tunnel to Cook's station (673), | 1760 |
| Cook's Station (RR.), | 1541 |
| Summit in road between Cook's station and Eagle foundry, | 1683 |
| Eagle foundry N. E. cor. of shop (1520), | 1261 |
| Summit of Grave mountain, | 2170± |
| Cross-roads near J. Diggins (1645), | 1634 |
| Cross-roads, summit of mountain between J. Diggins and Broadtop city (2255), | 2054 |
| Broadtop city, pavement at N. E. corner of Mountain house (1258), | 1997.2 |
| Cross-roads at church, 1½ miles S. W. from Broadtop city (2320), | 1996 |
| Trough creek, between Hoover place and Anderson's Alloway coal bank (2107), | 1848 |
| Robertsdale (RR.), | 1883 |
| Monkey drift, E. of RR. station, | 1785 |
| A. Mine, | 1772 |
| Mine No. 1 (B ¹), at mouth (1214), | 1813 |
| Mine No. 2 (B ²), nail top of first beam (1220), | 1789.3 |
| Mine No. 3 (C ¹), right hand rail at mouth of drift (1217), | 1799.6 |
| Mine No. 4 (C ²), on left hand rail at mouth of drift (1223), | 1814.8 |
| Summit in road between Robertsdale and New Gren-ada, (2776), | 1816.7 |
| Coal opening on seam A, near road, | 2151 |
| McLain openings, Wray's hill, E. of Robertsdale, . . | 2114 |
| Spring, on road above New Grenada, | 2132 |
| New Grenada, corner of shop at junction of Wells and Ground Hog valley roads, (1004), | 1845 |
| Methodist church, E. of Sideling hill gap, (1132), . . | 938.8 |
| Sideling hill creek, at Jack's mountain, anticlinal, (1195), | 921 |
| Dublin mills, dam in Sideling hill creek, | 838 |
| S. H. creek, at T. Wilson's, | 815 |
| Junction of Aughwick and Sideling hill creeks, | 800 |
| Summit of Clear ridge, at Solomon Taylor's, | 762± |
| Rotses' gap, Blacklog mountain, | 1144 |
| | 1540 |

This was a long line for vertical circle work, and the elevations cannot be depended upon within 5 to 10 feet.

The elevations in the above tables are based on levels of the East Broad

Top railroad, which latter have been reduced to mean Atlantic Ocean level, by referring them to the elevation of Mt. Union, (597') as given in Mr. Chas. Allen's tables.

January 2, 1878.

MR. CHAS. ALLEN.

DEAR SIR: I enclose a full and correct list of all levels obtained during 1875 and 1876, which depend upon the levels of the East Broad Top railroad. . . .

Yours very truly,

CHAS. E. BILLIN.

TABLE 9.

HUNTINGDON AND BROAD TOP RR.

| STATIONS. | Above Hunting- don. | Ocean Level. | Dist. from Hunting- don. |
|--------------------------------|---------------------------|--------------|--------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Huntingdon, | 000 | 621 | 0 |
| McConnellstown, | 52.6 | 674 | 5 |
| Pleasant Grove, | 127.2 | 748 | 7 |
| Marklesburg, | 167.6 | 789 | 11 |
| Coffee Run, | 250.6 | 872 | |
| Rough and Ready, | 267.6 | 889 | 17 |
| Cove, | 300 | 921 | |
| Fisher's Summit, | 353 | 974 | 21 |
| New Bridge, | 210.3 | 831 | |
| Saxton, (new depot), | 228 | 849 | 25 |
| Riddlesburg, | 243.6 | 865 | 30 |
| Hopewell, | 277.3 | 898 | 32 |
| Piper's Run, | 326.3 | 947 | |
| Brallier's Summit, | 487.3 | 1108 | |
| Tatesville, | 475.3 | 1096 | 41 |
| Bloody Run Summit, | 613.3 | 1234 | |
| Everett, | 497.3 | 1118 | 44 |

The levels on the Huntingdon and Broad Top RR. and its Branches, were furnished by Mr. John Fulton, General Mining Engineer of the Cambria Iron Works, at Johnstown, Pa.

The datum is at 0 grade on the Pennsylvania RR. at Huntingdon. To this 614, are added, +7' to reduce all to mean Atlantic ocean level.

This road has three coal branches up the three streams, which drain the Broad Top Coal Region. It originally stopped at Everett; but has been continued to Bedford and Bridgeport, under the name of the Bedford and Bridgeport Railroad. Table 10.

TABLE 10.
BEDFORD AND BRIDGEPORT RR.

| STATIONS. | Above Hunting- don. | Ocean Level. | Dist. from Mt. Dallas. |
|---|---------------------------|--------------|------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Mount Dallas, (above tide) . . . | 1046 | 1053 | 0 |
| Cove Creek, | 1026 | 1033 | 2 |
| Lutzville, | 1038 | 1045 | 3 |
| Bedford, | 1055 | 1062 | 8 |
| Wolfsburg Summit, | 1111 | 1118 | 11 |
| Napier, | 1101 | 1108 | 13 |
| Mann's Choice, | 1129 | 1136 | 16 |
| Buffalo Summit, | 1349 | 1356 | 21 |
| Fossilville, | 1084 | 1091 | |
| Bridgeport, <i>not the Bridgeport of Clearfield county, in Table 15,</i> . | 923 | 930 | 31 |
| Maryland State Line, <i>continued as Pittsburg and Connellsville Branch of the Baltimore and Ohio RR.</i> | 837 | 840 | 39 |

This is a continuation of the Huntingdon and Broad Top RR. of Table 9.

The elevations on the Bedford and Bridgeport RR. were furnished by Mr. S. M. Prevost, Superintendent of the Bedford Division of the Pennsylvania RR.

The datum 0 of this road was at grade of the Pennsylvania RR. at Huntingdon, which Mr. Prevost called 610; while Mr. Wilson calls it 614. The difference of 4 feet has, therefore, in the 2d column, been added to Mr. Prevost's figures, to make them agree with Mr. Wilson's figures, along the main line. The regular 7 feet addition has also been made in the second column, to reduce to mean Atlantic Ocean level.

TABLE 11.
SHOUP'S RUN BRANCH H. & B. T. RR.

| STATIONS. | Above Hunting- don. | Ocean Level. | Dist. from Saxton. |
|---|---------------------------|--------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Saxton, (<i>See Table 9,</i>) | 228 | 849 | |
| Coalmont, | 488.8 | 1110 | |
| Crawford, | 620.9 | 1242 | |
| Old M. P., | 662.7 | 1284 | |
| No. 3 Mine, | 784.5 | 1405 | |
| Barnet Mine, | 767 | 1388 | |
| Dudley Station, | 803.6 | 1425 | |

| | | | |
|--------------------------|--------|------|--|
| Blair's Mine, | 815.2 | 1436 | |
| Moredale, | 1058.7 | 1680 | |
| Water Station, | 1088 | 1709 | |
| End of Track, | 1240.2 | 1861 | |

TABLE 12.

SIX MILE RUN BRANCH OF H. & B. T. RR.

| STATIONS. | Above Hunting- don. | Ocean Level. | |
|--|---------------------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Riddlesburg, (<i>See Table 9,</i>) | 243.6 | 865 | |
| do Coal Mine, | 340.9 | 962 | |
| Coaldale, | 505.2 | 1126 | |
| End of Third Mile, | 573 | 1194 | |
| End of Fourth Mile, | 753 | 1374 | |
| End of Track, | 795 | 1416 | |

TABLE 13.

SANDY RUN BRANCH OF H. & B. T. RR.

| STATIONS. | Above Hunting- don. | Ocean Level. | |
|---|---------------------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Hopewell, (<i>See Table 9,</i>) | 277.3 | 898 | |
| End of Track, | 404 | 1025 | |

TABLE 14.

LEWISBURG, CENTRE AND SPRUCE CREEK RR.

| STATIONS. | Above Tide.* | Ocean Level.† | Ocean Level.§ | Dist. from P. & E. RR. Junction. |
|--|-----------------|------------------|------------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| P. and E. RR. Junction, <i>Junction with Philadelphia and Erie RR. Elevation by Mr. Chas. W. Ames at this point, 462.75; Lewisburg Station, 465.26; west end of RR. bridge crossing, Susquehanna river, 463; east end do., 463.2. Datum, Pa. RR. Harrisburg,</i> | 447 | 454 | 462 | 0 |
| Lewisburg, | 451 | 458 | 466 | 2 |
| Biehl, | 503 | 510 | 518 | 5 |

| | | | | |
|--|------|------|------|-----|
| Vicksburg, | 514 | 521 | 529 | 7 |
| Mifflinburg, | 550 | 557 | 565 | 11 |
| Millmont, | 570 | 577 | 585 | 16 |
| Laurelton, | 592 | 599 | 607 | 19 |
| Tunnel, <i>Through Paddy's Mountain</i> , | 944 | 951 | 959 | 32½ |
| Fowler's, | 976 | 983 | 991 | 34 |
| Beaver Dam Tunnel, | 999 | 1006 | 1014 | 35 |
| Caburn, <i>Forks of Penn's Creek</i> , | 1011 | 1018 | 1026 | 36 |
| Buchannon, <i>Mouth of Muddy Run</i> , | 1044 | 1051 | 1059 | 41 |
| Duncan, | 1063 | 1070 | 1078 | 43 |
| Centre Hall, | 1257 | 1264 | 1272 | 49 |
| Summit, <i>Summit of Penn's Valley, Head of Penn's Creek, and Head of Spring Creek, which enters Bald Eagle Creek after passing Bellefonte</i> , | 1275 | 1282 | 1290 | 50 |
| Lemont, <i>End of Nittany Mountain</i> , | 987 | 994 | 1002 | 58 |
| Kelly, <i>State Agricultural College</i> , | 1096 | 1103 | 1111 | 61 |
| Pinegrove, | 1221 | 1228 | 1236 | 64 |
| Shugarts, | 1116 | 1123 | 1131 | 67 |
| Lyon, (<i>Penna. Furnace</i>), | 1059 | 1066 | 1074 | 71 |
| Guyer, <i>Half Moon Gap</i> , | 1129 | 1136 | 1144 | 74 |
| Lowrie, <i>At Warrior's Mark</i> , | 1094 | 1101 | 1109 | 80 |
| Miller, <i>Logan's Run</i> , | 1055 | 1062 | 1070 | 84 |
| Tyrone, <i>L. C. & Sp. C. R.R. here connects with the Pa. R.R. (See Tab. I.)</i> | 892 | 899 | 907 | 88 |

* High tide, Schuylkill River, at Philadelphia?

† Calculated from the Lewisburg end.

‡ Adjusted to the Pennsylvania R.R. record at the Tyrone end.

NOTE.—The levels on the Lewisburg, Centre and Spruce Creek R.R. were furnished by Mr. George W. Leuffer, Chief Engineer. Mr. Leuffer says: "I will remark that many of the Stations have, as yet, not been located. The tide levels are based upon a level furnished by A. B. Starr, Esq., Engineer of P. & E. R.R., of a point in abutment of Chilesquaque Bridge (of P. & E. R.R.) and this agrees so closely with the level of tide, as stated in printed table of Pennsylvania R.R. Co., of Tyrone City, that I am inclined to rely upon the levels I now enclose."

The first column, then, gives the figures of Mr. Leuffer.

The second column has 7 feet added to Mr. Leuffer's figures, on the supposition that his datum is Pennsylvania R.R. datum of high water at the Schuylkill Bridge.

The third column has 8 feet added (in addition, = 15 feet in all) to agree with the final mean Atlantic Ocean level assigned to Tyrone, in the Pennsylvania R.R. table, No. 1.

TABLE 15.

TYRONE AND CLEARFIELD RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Tyrone. |
|--|----------------|--------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Tyrone, (<i>See Table I,</i>) | 900 | 907 | 0 |
| Bald Eagle RR. Junction, | 982 | 989 | |
| Vanscoyoc, | 1420 | 1427 | 6 |
| Gardner's, | 1561 | 1568 | 8 |
| Mt. Pleasant, | 1777 | 1784 | 10 |
| Emig's Summit, <i>Allegheny Mount-</i> <i>ain Summit,</i> | 2038 | 2043 | 13 |
| Sandy Ridge, | 1905 | 1912 | 15 |
| Powelton, | 1791 | 1798 | 16 |
| Osceola Branch RR., | 1481 | 1488 | 19 |
| Dunbar, | 1446 | 1453 | |
| Moshannon Creek, | 1435 | 1442 | |
| Steiner's Mill, | 1421 | 1428 | 22 $\frac{3}{4}$ |
| Phillipsburg, | 1418 | 1425 | 23 |
| Blue Ball, | 1540 | 1547 | 27 |
| Shimmels, | 1634 | 1641 | 29 |
| Wallacetown, | 1720 | 1727 | |
| Turner's Summit, | 1735 | 1742 | |
| Moravian Run, | 1731 | 1738 | |
| Ross' Summit, | 1744 | 1751 | |
| Smael's Summit, | 1704 | 1711 | |
| Camp Hummel, | 1675 | 1682 | |
| Bigler, | 1655 | 1662 | |
| Woodland, | 1465 | 1472 | 32 |
| Roaring Run, | 1420 | 1427 | 34 |
| Leonard's Point, | 1299 | 1306 | |
| Clearfield Creek, | 1133 | 1140 | 36 |
| Shaw's Run, | 1105 | 1112 | |
| Liberty Spring, | 1096 | 1103 | 41 |
| Clearfield, | 1096 | 1103 | |
| Goodfellow's Bridge, | 1103 | 1110 | |
| Spackman's Bluff, | 1110 | 1117 | |
| Susquehanna River, | 1117 | 1124 | |
| Hog Back, | 1119 | 1126 | |
| Hartshorn's Run, | 1125 | 1132 | |
| Curwensville, | 1134 | 1141 | |
| Anderson's Creek, <i>First Crossing,</i> | 1144 | 1151 | 47 |
| Anderson's Creek, <i>Second Crossing,</i> | 1159 | 1166 | |
| Bridgeport, <i>not the Bridgeport of</i> <i>Bedford county, (See Table 9,).</i> | 1183 | 1190 | |

The elevations on the Tyrone and Clearfield RR. were copied from a profile in the office of the Pennsylvania RR. Co., in Philadelphia.

In the second column, seven feet are added to reduce to mean Atlantic Ocean level.

TABLE 15b.

CLEARFIELD COUNTY LEVELS.

| STATIONS. | Tide. | Ocean Level. |
|--|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Tyrone Junction of T. & C. RR. and Pa. RR., | 892 | 895 |
| Vanscoyoc, | 1402 | 1405 |
| Gardner's, | 1553 | 1556 |
| Mt. Pleasant, | 1759 | 1762 |
| Emigh's Gap Summit, | 2025 | 2028 |
| Emigh's Gap Summit, Natural Sur- face of ground, | 2036 | 2039 |
| Osceola, | 1473 | 1476 |
| Pool, Osceola Dam, | 1444 | 1447 |
| Mouth of Beaver Run, | 1444 | 1447 |
| Do. Bear Run, | 1467 | 1470 |
| Do. Mountain Branch, | 1485 | 1488 |
| Do. Whiteside's Run, | 1488 | 1491 |
| Do. Wilson's Run, | 1633 | 1636 |
| Crest of Allegheny Mountain at Middle Summit, 3 Spring Gap, and source of Moshannon Cr., . . | 2233 | 2236 |
| Crest of Allegheny Mountain at Northern Summit, 3 Spring Gap, . . | 2278 | 2281 |
| Crest of Allegheny Mountain, one mile east of Northern Summit, 3 Spring Gap, and highest ground, . . | 2611 | 2614 |
| Crest of Allegheny Mountain in gap between north fork of Sinking Run and Mountain Branch, . . . | 2406 | 2409 |
| Crest of Allegheny Mountain in gap between Laurel Run and tributa- ry of Mountain Branch, | 2364 | 2367 |
| Crest of Allegheny Mountain in gap between Bear Run and Mount Pleasant Run, | 2221 | 2224 |
| Hale's Coal Bank, | 1638 | 1641 |
| Davis' Coal Bank on pike, two miles east of Janesville, | 1670 | 1673 |
| Little Muddy Run at pike crossing near Janesville, | 1450 | 1453 |
| Whiteside's Gap, in divide between Moshannon & Clearfield waters, . | 1618 | 1621 |

| | | | |
|--|--------|------|--|
| Confluence of Big and Little Muddy Runs, | 1321 | 1324 | |
| Spruce Flat Summit in divide between Beaver Run and Clearfield waters, | 1603.5 | 1607 | |
| Confluence of Big Muddy and Clearfield Creek, near Madeira, . . . | 1302 | 1305 | |
| Houtzdale, Level of top of rail of railroad at depot, | 1492 | 1495 | |
| Franklin Colliery Level of bottom of Coal Vein, | 1526 | 1529 | |
| Surface of water in Clearfield Creek at Glen Hope, | 1319 | 1322 | |
| Surface of water in Big Muddy Run at turnpike crossing, $1\frac{1}{2}$ miles west of Janesville, | 1345 | 1348 | |
| Hagerty's cross-roads, | 1568 | 1571 | |
| Stephen's Summit in Clearfield and Moshannon divide, | 1722 | 1725 | |
| Sand Spring, source of the Mountain Branch, | 2428 | 2431 | |
| Moshannon mines, three miles west of Osceola (?), | 1465 | 1468 | |

Statement of Levels in the Clearfield Region furnished by Mr. E. M. Leuffer, Civil Engineer. Add 3' for Ocean level.

TABLE 16.

BALD EAGLE VALLEY RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Tyrone. |
|--|--------------|--------------|--------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Tyrone, (<i>See Tables 1, 15, 16,</i>) . . | 900 | 907 | 0 |
| Spring Run, | 888 | 895 | |
| Dallas Street, | 921 | 928 | |
| Sinking Run, | 923 | 930 | |
| Little B. E. Creek, | 940 | 947 | |
| Bald Eagle, | 1051 | 1058 | 5 |
| L. B. E. Bridge, | 1065 | 1072 | |
| Summit, | 1103 | 1110 | |
| Hannah, | 1050 | 1057 | 10 |
| Port Matilda, <i>Main Street</i> , | 1000 | 1007 | 14 |
| B. E. Creek Bridge, | 917 | 924 | |
| Martha, | 905 | 912 | 17 |
| Julian, | 844 | 851 | 21 |

| | | | |
|--|-----|-----|----|
| Dick's Run, | 794 | 801 | |
| Unionville, | 775 | 782 | 26 |
| Snow Shoe RR., (16,) | 715 | 722 | 29 |
| Milesburg, (17,) | 693 | 700 | 31 |
| Bald Eagle Canal, | 664 | 671 | |
| Holters', | 644 | 651 | |
| Mount Eagle, | 655 | 662 | 37 |
| Bald Eagle Plank Road, | 658 | 665 | |
| Howard, | 672 | 679 | |
| Eagleville, | 628 | 635 | 44 |
| Beach Creek, | 607 | 614 | 46 |
| Mill Hall, | 566 | 573 | 51 |
| Lock Haven Junction, <i>Junction</i> <i>with the Philadelphia and Erie</i> <i>RR.,</i> | 548 | 555 | 54 |

The elevations on the Bald Eagle Valley RR. were copied from a profile in the office of the Pennsylvania RR. Company, at Philadelphia. The datum is the same as that of the P. RR.

In the second column seven feet are added to reduce to mean Atlantic Ocean Level.

TABLE 17.
BELLEFONTE AND SNOW SHOE RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Bell'fonte. |
|--|----------------|--------------|---------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Bellefonte, (<i>See Table 18,</i>) | 737 | 744 | 0 |
| Bald Eagle R.R. Junc., (<i>See Tab. 16,</i>) | 715 | 722 | 4 |
| Gum Stump, | 1013 | 1020 | 8 |
| Summit, <i>Allegheny Mountain Sum-</i> <i>mit,</i> | 1728 | 1735 | 14 |
| Beach Creek, <i>Level of water in</i> <i>Beach Creek,</i> | 1542 | 1549 | 18 |
| Beach Creek, <i>Level of rail over the</i> <i>water,</i> | 1592 | 1599 | |
| Snow Shoe, | 1565 | 1572 | 21 |
| Middle Coal bed, <i>Middle coal bed</i> <i>at the Company's mines at Coal</i> <i>Hill,</i> | 1599 | 1606 | |

The levels on the Bellefonte and Snow Shoe RR. were furnished by Mr. J. L. Sommerville, Resident Engineer. The datum is that of the Pennsylvania RR.

In the second column seven feet are added to reduce to mean Atlantic Ocean level.

TABLE 18.

BELLEFONTE BRANCH.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Milesbu'g. |
|--|----------------|--------------|--------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Milesburg, (<i>See Table 16,</i>) | 693 | 700 | 0 |
| B. E. V. Plank Road, | 692 | 699 | |
| Bellefonte, (<i>See Table 17,</i>) | 737 | 744 | 3 |

The levels on the Bellefonte Branch were copied from a profile in the office of the Pennsylvania R.R. Company, at Philadelphia, and have the datum of the P. R.R., to which are added seven feet to reduce to mean Atlantic Ocean level, in the second column.

TABLE 18b. CENTRE COUNTY LEVELS.

| STATIONS. | Tide. | Ocean Level. | |
|--|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Crossing Nittany Mountain at Heckley Furnace, | 1867 | 1874 | |
| Head of Penn's Creek, (water,) . . | 1129 | 1136 | |
| Spring Mills intersection with L. C. & S. C. R.R., | 1072 | 1079 | |
| Bellefonte and Lewistown turnpike crossing, Nittany Mountain, . . | 1650 | 1657 | |

Elevations of points on experimental line from Bellefonte to Spring Mills, by Mr. J. L. Sommerville, R. E., Bellefonte and Snow Shoe R.R.
Add 7' for Ocean Level.

TABLE 19.

BELL'S GAP (N. G.) R.R.

| STATIONS. | Bell's Mills.† | Correct- ed Tide. | Ocean Level. | Dist. from Bell's M Junc. |
|--|-------------------|----------------------|-----------------|------------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Bell's Mills Junction, (<i>See Tab. 1,</i>) | 0 | 1053 | 1060 | 0 |
| Roots', | 162 | 1215 | 1222 | |
| Collier, | 581.6 | 1635 | 1642 | 4 |
| Point Lookout, | 854.6 | 1908 | 1915 | 6 |
| Lloyd's Junction, <i>Junction with the Extension to Fallen Timber,</i> | 1107.4 | 2160 | 2167 | 8 |

| | | | | |
|--|--------|------|------|-----------------|
| Lloyd's Station, <i>Elevation of 5 foot coal bed at the mouth of gangway,</i> | 1119.7 | 2173 | 2180 | $8\frac{1}{2}$ |
| Summit, <i>Allegheny Mountain. Bench Mark, Summit of Mountain, on Pine Tree,</i> | 1240.5 | 2294 | 2301 | |
| Five Foot Coal, <i>Level of the 5 foot coal bed at Figart's, 4' vein 60 feet below,</i> | | 2116 | 2123 | |
| Figart's, | 1048 | 2101 | 2108 | |
| Vanscoyoc, | 935 | 1988 | 1995 | |
| Creess Summit, | 797 | 1850 | 1857 | |
| Hollen's, <i>Elevation at this point of the 3' vein, 1667'; of the 5' vein, 1727',</i> | 582 | 1635 | 1642 | |
| Three Foot Coal, | | 1667 | 1674 | |
| Five Foot Coal, | | 1727 | 1734 | |
| Van Ormer's, <i>Elevation of Water in Clearfield Creek. The elevation of the 3' vein here is 1475,</i> | 352.3 | 1405 | 1412 | |
| Three Foot Coal, | | 1475 | 1482 | |
| Fallen Timber, | 362 | 1415 | 1422 | $15\frac{1}{2}$ |

The elevations on the Bell's Gap Narrow Gauge RR. (3 feet) were furnished by Mr. Jos. Ramsey, jr., Superintendent.

The datum for the first column is 0 at Pennsylvania RR. grade at Bell's Mills Station. To which are added 1053' from Table 1 for the second column, and 7' for the third column, to reduce to mean Atlantic Ocean level.

TABLE 20.

HOLLIDAYSBURG BRANCH P. RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Altoona. |
|--|--------------|--------------|---------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Altoona, (<i>See Table 1,</i>) | 1172 | 1179 | 0 |
| Allegheny, | 1145 | 1152 | 1.6 |
| Eldorado, | 1086 | 1093 | 3.5 |
| Canan, | 1059 | 1066 | 4 |
| Duncansville, | 983 | 990 | 7 |
| Hollidaysburg, (<i>See Table 21,</i>) | 946 | 953 | 8 |
| End of Line, <i>3400' beyond the station marked Hollidaysburg,</i> | 937 | 944 | |

The levels on the Hollidaysburg Branch of the Pennsylvania R.R. were copied from a profile in the office of the P. R.R. Company, at Philadelphia.

The datum being mean high tide at the Schuylkill bridge, seven feet are added in the second column to reduce to mean Atlantic Ocean level.

TABLE 21.

WILLIAMSBURG BRANCH P. R.R.

| STATIONS. | Above Tide. | Ocean Level. | |
|--|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Gaysport, <i>Bench Mark on step of ladies' waiting room, Gaysport passenger station, 946.60,</i> . . | 947 | 954 | |
| Hollidaysburg, (<i>See Table 20,</i>) . | 935 | 942 | |
| Brush Run, | 926 | 933 | |
| Frankstown, <i>Frankstown or Main Branch of the Juniata River,</i> . | 911 | 918 | |
| Reese Station, | 896 | 903 | |
| Clapper's Run, | 894 | 901 | |
| Koofers Run, | 886 | 893 | |
| Juniata River, <i>Frankstown or Main Branch of Juniata River,</i> | 886 | 893 | |
| Pike Ponds, | 878 | 885 | |
| Flowing Spring, | 874 | 881 | |
| Springfield R.R. Junction, <i>Springfield Branch,</i> | 869 | 876 | |
| Williamsburg, | 840 | 847 | |

The levels on the Williamsburg Branch, the Morrison's Cove Branch, the Bloomfield Branch, and the Springfield Branch of the Pennsylvania R.R., were copied from profiles in the office of the Pennsylvania R.R. Company, at Philadelphia.

The datum being mean high tide at the Schuylkill bridge, seven feet are added to reduce to mean Atlantic Ocean level.

The Williamsburg Branch R.R. has been substituted for the old State canal, long since vacated, from Frankstown to Williamsburg, and shows the fall of the Juniata river.

TABLE 22.

MORRISON'S COVE BRANCH P. R.R.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Hollidaysburg. |
|---|--------------|--------------|---------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Hollidaysburg, (<i>See Table 20,</i>) | 935 | 942 | 0 |
| Draw Bridge, | 935 | 942 | |
| Juniata River, <i>Frankstown Branch of the Juniata River,</i> | 930 | 937 | |
| Reservoir, | 960 | 967 | 3 |
| Catfish, | 961 | 968 | |
| Riddle's Lane, | 966 | 973 | |
| Brooks Mill, | 999 | 1006 | |
| McKee's Gap, <i>through Dunning's Mountain,</i> | 1029 | 1036 | 7 |
| Martha Furnace, | 1047 | 1054 | |
| Hammond's, | 1126 | 1133 | |
| Roaring Spring Junction, (<i>See Table 23,</i>) | 1189 | 1196 | 9 |
| Erb's Summit, | 1347 | 1354 | 11 |
| Martinsburg Junction, | 1337 | 1344 | 14 |
| <i>Martinsburg,</i> | 1359 | 1366 | |
| Henrietta Junction, | 1384 | 1391 | |
| Mathew's Summit, | 1468 | 1475 | 17 |
| Nicodemus' Summit, | 1425 | 1432 | |
| Clover Creek, | 1385 | 1392 | |
| Henrietta Ore Bank, | 1402 | 1409 | 20 |
| End of Road, <i>in Leather Cracker Cove, the southern end of Morrison's Cove,</i> | 1415 | 1422 | |

TABLE 23.

BLOOMFIELD BRANCH P. R.R.

| STATIONS. | Above Tide. | Ocean Level. | |
|--|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Roaring Spring Junction, <i>Junc. of this branch with Morrison's Cove Branch R.R. (See Tab. 22.)</i> | 1189 | 1196 | |
| Trestle, No. 1, | 1211 | 1218 | |
| Trestle, No. 2, | 1351 | 1358 | |
| Bloomfield, <i>Iron Mines and Furnaces,</i> | 1453 | 1460 | |

TABLE 24.

SPRINGFIELD BRANCH P. RR.

| STATIONS. | Above Tide. | Ocean Level. |
|---|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Williamsburg RR. Junc. (See T. 21.) | 869 | 876 |
| Trestle, No. 1, | 961 | 968 |
| Goods, | 999 | 1006 |
| Davis Summit, | 1369 | 1376 |
| 8th Mile Post, <i>This RR. ascends from the Juniata River to the Springfield Ore Mines in Canoe Valley, the north-east prolonga- tion of Morrison's Cove, . . .</i> | 1367 | 1374 |

TABLE 25.

EBENSBURG AND CRESSON R.R.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Cresson RR. Junc. |
|--|--------------|--------------|------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Cresson RR. Junction, <i>the junction with Pa. RR. is not at Cresson, 2010' (2017') but near Cresson 2021' (2028) (See Table 1,) . .</i> | 2021 | 2028 | 0 |
| Plank Road Crossing, | 2032 | 2039 | |
| Lilly, | 2023 | 2030 | |
| O'Harra, | 2008 | 2015 | |
| Durbin, | 1920 | 1927 | |
| Sanders, | 2012 | 2019 | |
| Bradley's, | 2111 | 2118 | 8.3 |
| Dam, | 1953 | 1960 | |
| Ebensburg, | 2015 | 2022 | 11.3 |

The elevations on the Ebensburg and Cresson Railroad were copied from a profile in the office of the Pennsylvania R.R. Company, in Philadelphia.

The datum is mean high water at the Schuylkill Bridge, to which are added seven feet to reduce to mean Atlantic Ocean level.

TABLE 26.

BLAIRSVILLE AND INDIANA BRANCH P. RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from RR. Junc. |
|---|--------------|--------------|----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| RR. Junction with the main line Pennsylvania RR. on the side of Chestnut Ridge, high above the bed of the river, (See Table 1), . | 1106 | 1113 | |
| Pennsylvania Canal, | 958 | 965 | |
| Blairsville, Market Street Station, in Blairsville, | 1004 | 1011 | 0 |
| Smith's Summit, | 1094 | 1101 | 4 |
| Wier's Run, | 963 | 970 | |
| Black Lick, | 956 | 963 | 7 |
| Water Station, | 959 | 966 | |
| Black Lick Bridge, | 975 | 982 | |
| Doty's Ridge, | 1004 | 1011 | |
| Rough's, | 1031 | 1038 | 9 |
| Saw Mill Run, | 1009 | 1016 | |
| Bell's Mills Run, | 1025 | 1032 | |
| Phillip's Summit, | 1037 | 1044 | 13 |
| Rissinger Summit, | 1048 | 1055 | |
| Two Lick Creek, | 1037 | 1044 | 14 |
| Reed's, | 1138 | 1145 | 16 |
| Indiana terminus, | 1304 | 1311 | 19 |

The elevations on the Blairsville and Indiana Branch of the Pennsylvania RR. were taken from a profile in the office of the P. RR. Company, at Philadelphia.

The datum is high tide Schuylkill river, at the Philadelphia Market Street Bridge. To this seven feet are added in the second column to reduce to mean Atlantic Ocean level.

TABLE 27.

WEST PENN RR.*A.—Old Survey.*

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Blairsville Inters'n. |
|--|--------------|--------------|----------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Blairsville Intersection, | 1106 | 1113 | 0 |
| Blairsville, Market Street Station, Blairsville, (See Table 26,) . . | 1004 | 1011 | 3 |
| Livermore, | 932 | 939 | 8 |

| | | | |
|---|------|------|----|
| Saltsburg, <i>Market street, Saltsburg,</i> | 884 | 891 | 17 |
| Fairbank's, <i>Coal R.R. here connects,</i> | | | |
| <i>see next Table, 29,</i> | 926 | 933 | |
| Helena, | 1010 | 1017 | |
| Salina, | 948 | 955 | |
| North-West, | 887 | 894 | 22 |
| Roaring Run, | 820 | 827 | |
| Apollo, | 816 | 823 | 27 |
| Townsend's Summit, | 880 | 887 | |
| Grinder's, | 820 | 827 | |
| Bagdad, | 773 | 780 | |
| A. V. R.R. Crossing, <i>Crossing Alle-</i> | | | |
| <i>gheny Valley R.R.,</i> | 782 | 789 | 37 |
| Freeport, <i>Second street, Freeport,</i> | | | |
| <i>(See Table 30,)</i> | 763 | 770 | 38 |
| Sligo, | 763 | 770 | |
| Karn's, | 761 | 768 | |
| Natrona, | 761 | 768 | 43 |
| Tarentum, | 750 | 757 | 45 |
| Bailey's Run, | 746 | 743 | |
| Springdale, | 742 | 749 | 50 |
| Harmersville, | 736 | 743 | 54 |
| Fairview, | 734 | 741 | |
| Ross, | 738 | 745 | |
| Sharpsburg, <i>Main street, Sharps-</i> | | | |
| <i>burg,</i> | 732 | 739 | 61 |
| Bennett's, | 734 | 741 | |
| Duquesne Borough, | 734 | 741 | |
| Allegheny City, <i>Sycamore street,</i> | | | |
| <i>Allegheny City,</i> | 736 | 743 | |
| Allegheny City, <i>Chestnut street,</i> | | | |
| <i>Allegheny City,</i> | 738 | 745 | |
| Allegheny City, <i>East Lane, Alle-</i> | | | |
| <i>gheny City,</i> | 736 | 743 | 67 |
| Terminus, <i>Opposite Pittsburg, and</i> | | | |
| <i>connecting with the Pittsburg,</i> | | | |
| <i>Fort Wayne and Chicago R.R.</i> | | | |
| <i>lines,</i> | 734 | 741 | |

The above table was corrected by Mr. W. H. Wilson, Consulting Engineer, Pa. R.R. The table following is furnished by Mr. John F. Carll, and is published for information and comparison.

The levels of the West Penn. R.R. were copied from a profile in the office of the Pennsylvania R.R. Company, at Philadelphia.

The datum is mean high tide in the Schuylkill River, at Philadelphia. In the second column seven feet are added to reduce to mean Atlantic Ocean level.

This railroad follows down the valley of the Kishkimitas from Blairsville to Freeport, sometimes using the bed of the old State Canal.

TABLE 28.
WEST PENN RR.
B.—J. F. Carll's Corrections.

| | Corrected Levels. J. F. Carll. | Allen. Table 27. |
|--|--------------------------------------|---------------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Blairsville Intersection, <i>Junction noted on profile P. RR. as 1113 feet,</i> | 1113 | |
| Blairsville, <i>Market St. Station, Blairsville,</i> (<i>See Table 27,</i>) | | 1011 |
| Livermore, | | 945 |
| Saltzburg, <i>Market St., Saltzburg,</i> | | 891 |
| Fairbanks, <i>Junction of Coal Road,</i> | | 933 |
| Helena, | | 1017 |
| Salina, | | 955 |
| North West, | | 894 |
| Roaring Run, | | 830 |
| Apollo, | | 823 |
| Townsend's Summit, | | 887 |
| Grinders, | | 827 |
| Hills Mills, | | 780 |
| A. V. RR. Crossing, <i>Crossing A. V. RR.</i> <i>This elevation (785) is probably a mistake,</i> <i>Bench Mark, 783.44, (see A. V. Levels,) at</i> <i>this point having been taken instead of the</i> <i>crossing. Looking at it in this way, we</i> <i>find the West Penn levels 1'.56 too high at</i> <i>this point. (785—783.44=1'.56.) At Free-</i> <i>port, the point of elevation is too uncertain</i> <i>for comparison. At Allegheny City, by</i> <i>our levels run back from the Union De-</i> <i>pot, Pittsburg, the West Penn. levels are</i> <i>still too high. On Sycamore St., 1.60, and</i> <i>on East Lane, 1.32, as seen above,</i> | 790.64 | 785 |
| Freeport, <i>Second St., in the 2d Column.</i> <i>Depot in the 1st Column,</i> | 772.20 | 770 |
| Butler Junction, <i>Junction of Butler Branch,</i> Sligo, | 768.69 | 775 |
| Karn's | | 768 |
| Natrona, | | 768 |
| Tarentum, | | 757 |
| Bailey's Run, | | 753 |
| Springdale, | | 749 |
| Hammersville, | | 743 |
| Fairview, | | 741 |
| Ross, | | 745 |
| Sharpsburg, <i>Main St.,</i> | | 739 |

| | | |
|---|--------|-------|
| Bennetts, | | 741 |
| Duquesne Borough, | | 741 |
| Allegheny City, <i>Sycamore St.</i> , | 741.40 | 743 |
| Allegheny City, <i>Chestnut St.</i> , | | |
| Allegheny City, <i>East Lane</i> , | 741.68 | 745 |
| Junction with P. Ft. W. & Chicago RR., | 738.75 | 743 |
| Terminus, | | |
| B. M. Union Depot, Pittsburg, | 745.26 | 741 |
| B. M. Union Depot, Pittsburg, by West Penn. levels carried forward, | | 746.6 |

The above table represents the results of Mr. Carll's researches and levellings in 1876-7, to discover and redress the important discrepancies seen to exist in the records of levels of Western Pennsylvania, especially along the Allegheny River Valley and its branches. See Reports of Progress I.I. and I.I.I.

TABLE 29.
WEST PENN RR.---Branch Line.

| STATIONS. | Above Tide. | Ocean Level. | |
|--|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Fairbank's Junction, (<i>See Tab. 28.</i>) | 926 | 933 | |
| Grade near Mines, | 1111 | 1118 | |
| Bottom of Coal Bed, | 1133 | 1140 | |

The levels on the Branch of the West Penn. RR., from Fairbank's Station to the Coal Mines, were furnished by Mr. George W. Leuffer, C. E. The datum 0 is at grade of W. P. RR., Fairbank's Station.

TABLE 30.
BUTLER BRANCH W. P. RR.
A.—Old Surveys.

| STATIONS. | Mid. Tide Philad'a. | 2d Column. | Ocean Level. | |
|---------------------------------------|---------------------|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | |
| Freeport Junc., (<i>See T. 28.</i>) | 792.5† | 763† | 770 | |
| Buffalo, | 792.5 | 763 | 770 | |
| Monroe, | 865.5 | 836 | 843 | |
| Sarver's, | 1056 | 1026.5 | 1034.5 | |
| Saxon, | 1254.5 | 1225 | 1232 | |
| Delano, | 1255.5 | 1226 | 1233 | |

| | | | | |
|------------------------------------|--------|--------|--------|--|
| Dilke's, | 1335 | 1305.5 | 1313.5 | |
| Summit, <i>West of Dilke's</i> , . | 1344.5 | 1315 | 1322 | |
| Great Belt City, | 1286.5 | 1257 | 1264 | |
| Summit, <i>East of Herman</i> , . | 1328 | 1298.5 | 1306.5 | |
| Herman, | 1323.5 | 1294 | 1301 | |
| Bunker's, | 1285.5 | 1256 | 1263 | |
| Butler, | 1031.5 | 1002 | 1009 | |

† Levels furnished by Mr. Antes Snyder.

‡ Elevation on profile of West Penn. RR., at Freeport.

The levels on the Butler Branch Extension of the West Penn. RR. were furnished by Mr. Antes Snyder, Engineer, Springdale, Allegheny county, Pa.

There is an unexplained difference of 29.5 feet between the Butler Branch RR. grade and the West Penn. RR. grade at Freeport, where they ought to be the same.

Another list was obtained from Mr. J. M. C. Creighton, differing very slightly from Mr. Snyder's; but still leaving an *unexplained difference of 27 feet at Freeport.*

The second column in the first table gives Mr. Snyder's levels *let down 29½ feet*, and in the second table Mr. Creighton's levels let down 27 feet.

The third column has seven feet added to reduce to mean Atlantic Ocean level.

The datum of both tables is called "Mid Tide" at Philadelphia, which would require an addition of only 3.349 feet (instead of 7) to his original figures. But this "Mid Tide" may be a mistake for the "Mean High Tide" of the Pennsylvania RR. Company's datum, and is so taken.

TABLE 30b.
BUTLER BRANCH W. P. RR.
C.—Old Survey.

| STATIONS. | Mid Tide, Philada. | 2d Column. | Ocean Level. | Distance. |
|--------------------------------------|-----------------------|--------------|-----------------|---------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Freeport J., (<i>See Tab. 26,</i>) | 790† | 763‡ | 770 | 0 |
| Buffalo, | 788 | 761 | 768 | 0.5 |
| Harbison, | 824 | 797 | 804 | 3.2 |
| Monroe, | 862 | 835 | 842 | 4.6 |
| Sarver's, | 1052 | 1025 | 1032 | 7.6 |
| Saxonberg, | 1227 | 1200 | 1207 | 10.5 |
| Delano, | 1252 | 1225 | 1232 | 11.5 |
| Dilke's, | 1337 | 1310 | 1317 | 13.3 |
| Great Belt, | 1285 | 1258 | 1265 | 14.2 |
| Herman, | 1318.50 | 1291 | 1298 | 15.7 |
| Bunker, | 1288.38 | 1261 | 1268 | 16.5 |
| Butler, B., | 1030 | 1003 | 1010 | 21 |

† Elevation furnished by Mr. J. McC. Creighton, Superintendent West Penn. Division, Pennsylvania R.R.

‡ Elevation on profile of West Penn. R.R. at Freeport.

TABLE 31.
BUTLER BRANCH W. P. RR.

B.—New Survey.

| STATIONS. | Above Ocean Corrected Levels. | Miles. |
|---|-------------------------------------|--------|
| | <i>Feet.</i> | |
| Freeport Station, | 772.2 | |
| Butler Junction, (a,) | 768.7 | 0 |
| Buffalo Station, | 766.4 | 0.5 |
| B. M. on S. Wall Culvert, lower inside corner, | 768.4 | |
| Mile Post, | 774.3 | 1 |
| B. M. on Culvert, | 777.8 | |
| Mile Post, | 789.2 | 2 |
| do. | 797.5 | 3 |
| Harbison Station, | 801.6 | 3.2 |
| B. M. on E. Wall Culvert, upper inside corner, | 799.2 | |
| Mile Post, | 820.2 | 4 |
| B. M. on N. edge of E. Approach to Bridge No. 1, | 820.1 | |
| Monroe Station, | 840 | 4.6 |
| B. M. on N. edge of E. Approach to Bridge No. 2, | 848.3 | |
| Mile Post, | 858.6 | 5 |
| Sandy Lick Station, | 887.1 | 5.6 |
| Mile Post, | 909.6 | 6 |
| B. M. on N. edge of E. Approach to Bridge No. 3, | 969.1 | |
| B. M. on N. edge of E. Approach to Bridge No. —, | 977.8 | |
| Mile Post, | 980.6 | 7 |
| Sarver's Station, | 1026.8 | 7.6 |
| Mile Post, | 1053.8 | 8 |
| B. M. on N. edge of E. Approach to Bridge No. —, | 1057.1 | |
| B. M. on N. end of E. Wall of Culvert, . . . | 1091.6 | |
| B. M. on upper end of E. Abutment Bridge No. —, | 1105.5 | |

| | | |
|---|---------|------|
| Mile Post, | 1121.2 | 9 |
| B. M. on upper end of E. Wall of Culvert, . | 1131.7 | |
| B. M. on upper end of E. Wall of Culvert, . | 1180.1 | |
| Mile Post, | 1184.9 | 10 |
| Saxonburg Station, | 1200.9 | 10.5 |
| B. M. on "Water Table" of Water Tank, . . | 1210.6 | |
| Mile Post, | 1210.5 | 11 |
| B. M. on lower side of Culvert, | 1210.3 | |
| Delano Station, | 1224.2 | 11.5 |
| B. M. on lower side of Culvert, | 1227.7 | |
| Mile Post, | 1248.5 | 12 |
| Dilks' Station, | 1307 | 13.2 |
| B. M. on rock in small Culvert, | 1312.3 | |
| Summit, | 1317.1 | 13.4 |
| Mile Post, | 1276.1 | 14 |
| Great Belt City road crossing, | 1260 | 14.3 |
| B. M. on West end of Cellar door-step of Jefferson House, Great Belt City, | 1261.25 | |
| Summit, | 1301.6 | |
| Herman, | 1300.6 | 16.1 |
| Butler, | 1008 | 21 |

(a.) The following levels show the connection between Allegheny Junction and Butler Junction:

| | |
|--|--------|
| A. V. RR. and W. P. RR. Junction, | 790.64 |
| Top of River Rail opposite 29th M. Post W. P. RR., | 787.6 |
| Do. do. Freeport Station, W. P. RR., | 772.2 |
| B. M. on lower inside cor. S. Abut., Buffalo Creek Bridge, | 766.61 |
| Butler Junction, | 768.69 |

The elevations here given are for the top of the north rail, opposite the points named, except the B. M.'s. All B. M.'s on stone marked thus ×. The road is considered as running east and west.

The levels on the Butler Branch were carefully run and checked by John H. Carl and Arthur Hale, in February, 1877, from Allegheny Junction, on the A. Valley RR., to Great Belt City, for the purpose of checking our line of levels carried across the country, along the oil belt, from Parker City Depot to Great Belt Station, by Messrs. Hatch and Hale, in 1875, and Messrs. Chance and Hale, in 1876. The whole circuit from Allegheny Junction to Great Belt, from Great Belt to Parker City, by our levels, and from Parker City to Allegheny Junction, by levels of the A. V. RR. checked at all points within six inches. The levels are therefore considered very satisfactory.

Mr. Chance, in prosecuting his work in this section in 1876, ran up as far as Herman Station. Beyond this point the levels have not been proven. Butler, therefore, is only provisionally given in the table. The elevation given, however, cannot differ much from the true one.

J. F. CARLL.

TABLE 32.
LIGONIER VALLEY RR.

| STATIONS. | Above Tide. | Ocean Level. | |
|--|----------------|-----------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Ligonier, | 1141 | 1748 | |
| Mill Creek, (Surface of water,) . . | 1128 | 1135 | |
| Coal Pit Run, | 1129 | 1136 | |
| Schriner's Run, | 1124 | 1131 | |
| Turnpike Crossing, <i>Greensburg and Stoystown</i> , | 1120 | 1127 | |
| Butter Milk Falls, <i>Loyalhanna Creek</i> , | 1120 | 1127 | |
| Baker's Saw Mills, <i>at a point oppo- site Baker's Saw Mills</i> , | 1114 | 1121 | |
| Little Rock Hollow, | 1093 | 1100 | |
| Big Rock Hollow, | 1077 | 1084 | |
| Kellog's Hollow, | 1065 | 1072 | |
| Iron Ore, <i>outcrop of iron ore on line of R.R., 7 miles from Ligo- nier and 3 miles from Latrobe</i> , . | 1037 | 1044 | |
| Johnson's Forge, | 1033 | 1040 | |
| Derry Road Crossing, | 1027 | 1034 | |
| Mitchell's Run, <i>near Latrobe, on the Pennsylvania R.R. Table 1</i> , . | 1026 | 1043 | |

The levels on the Ligonier Valley R.R. were copied from notes in possession of Mr. George L. Miller, C. E., Pittsburgh, Pa. The datum is Pennsylvania R.R. at Latrobe.

TABLE 33.
SOUTH-WEST PENNSYLVANIA RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Greensb'g |
|---|----------------|-----------------|-------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Greensburg, | 1084 | 1091 | 0 |
| Greensburg Junction, <i>Junction with Pennsylvania R.R. near Greens- burg, (See Table 1.)</i> | 1063 | 1070 | |
| East Greensburg, | 1055 | 1062 | 1 |
| Huffs, | 994 | 1001 | 3 |
| County Home, | 972 | 979 | |
| Fosterville, | 960 | 967 | 5 |
| Youngwood, | 950 | 957 | 6 |
| Jack's Run, | 947 | 954 | |

| | | | |
|------------------------------|------|------|----|
| Paintersville, | 945 | 952 | 8 |
| Sewickley Creek, | 936 | 943 | |
| Hunker's, \ | 938 | 945 | |
| Bethany, | 1044 | 1051 | |
| Tarr's, | 1092 | 1099 | 13 |
| Stoner's Summit, | 1138 | 1145 | |
| Hawk Eye, | 1060 | 1067 | |
| Scottdale, | 1035 | 1042 | 18 |
| Jacob's Creek, | 1027 | 1034 | |
| Everson, | 1027 | 1034 | |
| Valley Works, | 1068 | 1075 | 19 |
| Pennsville Summit, | 1086 | 1093 | |
| Pennsville, | 1047 | 1054 | 20 |
| Davidson, | 891 | 898 | |
| Connellsville, | 908 | 915 | 25 |

The levels of the South-West Pennsylvania R.R. were furnished by Mr. G. W. Leuffer, Engineer.

The datum or base of levels is ordinary High Tide at Philadelphia.

TABLE 34.
YOUGHIOGHENY R.R.

| STATIONS. | Above Tide. | Ocean Level. | |
|---|----------------|-----------------|--|
| | <i>Fect.</i> | <i>Fect.</i> | |
| Irwin's Stat., P. R.R., <i>Junction with Pennsylvania R.R. at Irwin's Station. See Table 1,</i> | 877 | 884 | |
| Shaft No. 2, | 986 | 993 | |
| Tunnel, | 1104 | 1111 | |
| Chamber's, | 1075 | 1082 | |
| McGrew's, | 974 | 981 | |
| Millgrove, | 857 | 867 | |
| Little Sewickley, <i>First Crossing Little Sewickley Creek,</i> | 783 | 790 | |
| Marchand's, <i>Youghiogheny Mine, No. 1, Shaft No. 3, elevation of Coal, 760'.4 above Tide,</i> | 766 | 773 | |
| Youghiogheny, <i>Youghiogheny Mine, No. 2, elevation of Coal, 776'.4 above Tide,</i> | 776 | 783 | |
| Sewickley Station, <i>Mine No. 4, elevation of Coal opening at this point, 800'.4 above Tide,</i> | 773 | 780 | |
| R.R. Junc., <i>Junction with Pittsburg & Connellsville R.R. (See T. 150,)</i> | 761 | 768 | |

The elevations on the Youghiogheny RR. were copied from notes in the possession of Mr. John F. Wolf, Engineer Penn Gas Coal Co. Irwin's Station, Westmoreland County, Pa.

The datum is Pennsylvania RR. at Irwin's Station.



II. THE READING RR. SYSTEM.

TABLE 35.

PHILADELPHIA AND READING RR.—Main Line.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Philada. |
|---|----------------|-----------------|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Philadelphia, <i>Richmond Street Bridge, near the Coal Depots on the Delaware river,</i> | 25 | 28 | 0 |
| Nicetown Summit, <i>in Philadelphia, near the Germantown Road. The Germantown RR. crosses the P. & R. RR. in Nicetown, on a bridge at an elevation of 136 (139) feet; but not at this summit. See Table 35,</i> | 119 | 122 | |
| Belmont, | 46 | 49 | 3½ |
| West Falls, | 58 | 61 | 5 |
| Pencoyd, | 58 | 61 | 6½ |
| West Manayunk, | 58 | 61 | 7½ |
| Mill Creek, | 58 | 61 | 9½ |
| West Spring Mill, | 58 | 61 | 12 |
| West Conshohocken, | 58 | 61 | 13½ |
| Swede Furnace, | 63 | 66 | |
| Bridgeport. <i>Norristown opposite Bridgeport is given in this list as 72, (75.) See Table 35. Bridgeport is at the Junction of the Chester Valley RR. See Table 37.</i> | 73 | 76 | 17 |
| Merion, | 78 | 81 | 19 |
| Port Kennedy, (<i>Table 37.</i>) | 84 | 87 | 21½ |
| Valley Forge, | 95 | 98 | 23½ |
| Perkiomen Junction, <i>Perkiomen RR., (Table 39.)</i> | 106 | 109 | 25 |
| Phoenixville, <i>Pickering Valley RR., (Table 38.)</i> | 107 | 110 | 27½ |
| Mingo, | 113 | 116 | 30½ |
| Royer's Ford, | 124 | 127 | 32 |
| Limerick, | 135 | 138 | 34 |

| | | | |
|--|-----|-----|------------------|
| Pottstown, <i>Colebrookdale RR.</i> , (40,) | 147 | 150 | 40 |
| Douglassville, | 158 | 161 | 44 $\frac{1}{2}$ |
| Monocacy, | 159 | 162 | 47 $\frac{1}{2}$ |
| Birdsboro, <i>Wilmington and Reading RR.</i> , | 170 | 173 | 49 |
| Exeter, | 190 | 193 | 52 |
| Neversink, | | | 54 |
| Reading, <i>Lebanon Valley RR. Reading and Columbia RR. East Penn RR.</i> , (Tables 41, 42, 43, 44,) | 265 | 268 | 58 |
| Tuckerton, | 295 | 298 | 63 |
| Leesport, | 295 | 298 | 66 |
| Mohrsville, | 299 | 302 | 68 $\frac{1}{2}$ |
| Shoemakersville, | 311 | 314 | 70 |
| Hamburg, | 372 | 375 | 75 |
| Port Clinton, <i>Little Schuylkill RR.</i> , (49,) | 407 | 410 | 78 |
| Auburn, <i>Schuylkill and Susquehanna RR.</i> , (Table 50,) | 468 | 471 | 83 |
| Landingville, | 500 | 503 | 86 |
| Schuylkill Haven, <i>West Branch RR.</i> , | 523 | 526 | 89 |
| Mount Carbon, | 603 | 606 | 92 |
| Pottsville, <i>Mill Creek RR. Schuylkill Valley RR.</i> , (Table 54,) | 611 | 614 | 93 |

The elevations at the following points on the Philadelphia and Reading Railroad and Branches, were furnished by Mr. Wm. Lorenz, Chief Engineer.

The datum is *mid tide* at Philadelphia.

To this must be added 3.349 feet, to reduce to Atlantic Ocean level.

PHILA., *December 18, 1876.*

CHAS. ALLEN, Esquire, *Harrisburg, Pa.*

DEAR SIR: Enclosed please find the levels of the Reading Series, of the Second Geological Survey of Pennsylvania, corrected and completed. We have carefully adjusted our levels, and checked them in such a manner as to leave their correctness out of doubt. * * * *

Very respectfully,

W. LORENZ, *Chief Engineer.*

TABLE 36.

**GERMANTOWN AND NORRISTOWN BRANCH
P. and R. RR.**

| STATIONS. | Mean Tide. | Ocean Level. |
|---|---------------|-----------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Philadelphia, <i>Depot at the corner of Ninth and Green streets, See Table 1,</i> | 44 | 47 |
| Nicetown, <i>Crosses the P. & R. RR. on a bridge, but not at the Nicetown Summit in Table 35,</i> . . . | 136 | 139 |
| Columbia Avenue—See below, . . | 62 | 65 |
| New York Junction, | 102 | 105 |
| Tioga, | 126 | 129 |
| Wayne, | 153 | 156 |
| Fisher's, | 180 | 183 |
| Duey's, (or Wistar street,) | 188 | 191 |
| Shoemaker's, | 198 | 201 |
| Church Lane, | 204 | 207 |
| Germantown Depot, | 212 | 215 |
| Chestnut Hill, | 407 | 410 |
| Philadelphia, <i>as above,</i> | 44 | 47 |
| Columbia Avenue, <i>as above,</i> . . . | 62 | 65 |
| New York Junction, | 102 | 105 |
| East Falls, | 116 | 119 |
| School Lane, | 105 | 108 |
| Wissahickon, | 86 | 89 |
| Schur's, | 68 | 71 |
| Manayunk, | 54 | 57 |
| Springfield, | 66 | 69 |
| Shawmont, | 66 | 69 |
| Princeton, | 59 | 62 |
| Lafayette, | 50 | 53 |
| Spring Mill, | 50 | 53 |
| Conshohocken, | 56 | 59 |
| Potts' Landing, | 60 | 63 |
| Magee's, | 61 | 64 |
| Norristown, (<i>See Table 64.</i>) <i>The N. Penn. RR. level, Stony Creek branch, is 50' (62' Ocean level.)</i> | 72 | 75 |

TABLE 37.
CHESTER VALLEY RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Bridgep't. |
|--|--------------|--------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Bridgeport, <i>Opposite Norristown,</i> <i>See Table 35,</i> | 73 | 76 | 0 |
| Shainlines, | 133 | 136 | |
| Henderson's, | 162 | 165 | 2 |
| King of Prussia, | 187 | 190 | 3½ |
| Centreville, | 199 | 202 | 6 |
| Gardens, | 222 | 225 | 7 |
| Howellville, | 218 | 221 | 8½ |
| Paoli Road, | 235 | 238 | 9½ |
| Cedar Hollow, | 243 | 246 | 10 |
| Lee's, | 276 | 279 | 10½ |
| Valley Store, | 292 | 295 | 11½ |
| Mill Lane, | 312 | 315 | 13 |
| White Horse, | 336 | 339 | 14 |
| Exton, | 321 | 324 | 16 |
| Oakland, | 298 | 301 | 18 |
| Baldwin's, | 296 | 299 | 19½ |
| Downingtown, <i>on the Pennsylvania</i> <i>R.R., See Table 1,</i> | 264 | 267 | 21½ |

The levels on the Chester Valley Railroad were furnished by Mr. W. H. Holstein, Secretary of the Chester Valley Railroad Company.

The road connects with the Philadelphia and Reading Railroad at Bridgeport, and with the Pennsylvania R.R. at Downingtown.

The base of the levels is *mid tide* at Philadelphia. Add 3.349 to reduce to Ocean level.

TABLE 38.
PICKERING VALLEY RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Phoenixville. |
|--|--------------|--------------|--------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Phoenixville, <i>See Table 35,</i> . . | 107 | 110 | 0 |
| French Creek, | 125 | 128 | 2 |
| Kimberton, | 208 | 211 | 4 |
| Pikeland, | 269 | 272 | 7 |
| Chester Springs, | 275 | 278 | 7½ |
| Cambria, | 319 | 322 | 9½ |
| Byer's Eagle Summit, | 423 | 426 | 11½ |

Datum (Reading R.R.) mean tide at Philadelphia. Add 3.349 for Ocean level.

TABLE 39.
PERKIOMEN RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Perkiomen Junc. |
|---|---------------|-----------------|-------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Perkiomen Junction, <i>Reading R.R.</i> , | | | |
| <i>See Table 35,</i> | 106 | 109 | 0 |
| Oaks, | 127 | 130 | 1½ |
| Doe Run, | 120 | 123 | |
| Yerke's, | 131 | 134 | 4½ |
| Collegeville, | 152 | 155 | 6 |
| Rahn's, | 135 | 138 | 7½ |
| Grater's Ford, | 146 | 149 | 8.8 |
| Skippack, | 142 | 145 | 10 |
| Schwenksville, | 149 | 152 | 11 |
| Green Land, | 243 | 246 | 19 |
| Emaus Junction, <i>East Penn R.R.</i> , | | | |
| <i>See Table 48,</i> | 388 | 391 | 45½ |

TABLE 40.
COLEBROOKDALE RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Pottstown |
|---|---------------|-----------------|-------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Pottstown, <i>Reading R.R.</i> , (<i>Tab. 35.</i>) | 147 | 150 | 0 |
| Glasgow, | 162 | 165 | 2 |
| Manatawny, | 189 | 192 | 4 |
| Iron Stone, | 309 | 312 | 5½ |
| Colebrookdale, | 313 | 316 | 7 |
| Boyertown, | 386 | 389 | 8 |
| New Berlin, | 361 | 364 | 10 |
| Bechtelsville, | 398 | 401 | 12 |
| Mt. Barto, | 466 | 469 | 13½ |
| Rittenhouse Gap, | | | 20 |
| Alburtis, <i>East Penn R.R.</i> , (<i>Tab. 48.</i>) | 442 | 445 | 24 |

TABLE 41.
WILMINGTON AND READING RR.

| STATIONS. | Low Tide. | Ocean Level. | Dist. from Birdsboro' Junction. |
|---|-----------|--------------|---------------------------------------|
| | Feet. | Feet. | Miles. |
| Birdsboro' Junction, <i>Junction with Philadelphia and Reading RR. at Birdsboro', Berks county, Pa. See Table 35,</i> | 173 | (173) | 0 |
| Hampton, | 223 | | 2.7 |
| White Bear, | 349 | | 4.6 |
| Geigertown, | 432 | | 6 2 |
| Cold Run, | 525 | | 7.7 |
| Joanna, | 627 | | 10.2 |
| Springfield, | 645 | | 12.4 |
| Conestoga, | 647 | | 13.7 |
| Isabella, | 639 | | 15.7 |
| E. B. & W. RR. Crossing, <i>Junction with E. Brandywine and Waynesburg RR, Chester county, Pa., See Table 2,</i> | 647 | | 19 |
| Beaver dam, | 603 | | 21.3 |
| Honeybrook, | 596 | | 23.1 |
| Manor, | 572 | | 25.9 |
| Hibernia, | 530 | | 27 |
| Brandywine, | 556 | | 27.6 |
| Coatesville, <i>The Pennsylvania RR. track on bridge just west of Coatesville Station is 62' higher than track on W. & R. RR. The elevation on Pennsylvania RR., at the point where it crosses the W. & R. RR., is 374' above tide. By deducting 62', according to Pennsylvania RR. datum, the elevation would be 312'. The datum of the Pennsylvania RR. is high tide in Schuylkill River. The datum of W. & R. RR. is low tide at Wilmington,</i> | 315 | | 30.7 |
| Modena, | 278 | | 33.3 |
| Mortonville, | 260 | | 36.1 |
| Laurel, | 241 | | |
| Embreeville, | 231 | | 38.3 |
| Glen Hall, | 218 | | 41.4 |
| Northbrook, | 209 | | |

| | | | |
|-------------------------|-----|-----------|------|
| Seeds, | 195 | | 43.3 |
| Lenape, | 183 | | 45.2 |
| Pecopson, | 180 | | 46 |
| Chadd's Ford, | 175 | | 48 |
| Smith Bridge, | 209 | | 53 |
| Centre, | 263 | | 54.6 |
| Dupont's, | 282 | | 60 |
| Wilmington, | 12 | (12) | 63 |

These levels of the Wilmington and Reading RR. were furnished by Mr. E. Collings, Superintendent.

The datum, or base of levels, is low tide at Wilmington, Delaware. Relation of Ocean level to this datum is unknown.

TABLE 42.
LEBANON VALLEY RR.
(A.) Official Survey.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Reading. |
|---|--------------|--------------|---------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Reading, <i>Reading RR.</i> , (Table 35,) | 265 | 268 | 0 |
| Schuylkill Bridge, | 271 | 274 | |
| Sinking Springs, <i>Reading and Columbia RR.</i> , (See Table 44,) . . | 345 | 348 | 6 |
| Wernersville, | 385 | 388 | 9 |
| Heidelberg, | 376 | 379 | 10 |
| Robesonia, | 438 | 441 | 12½ |
| Sand Holes Summit, | 474 | 477 | |
| Womelsdorf, | 453 | 456 | 15 |
| Smith's, | 469 | 472 | |
| Sheridan, | 456 | 459 | 17½ |
| Richland, | 488 | 491 | 19 |
| Myerstown, | 471 | 474 | 21½ |
| Prescott, | 498 | 501 | 24 |
| Avon, | 484 | 487 | 26 |
| Lebanon, | 463 | 466 | 28 |
| C. RR. Junction, <i>Cornwall RR. Junction</i> , (Table 47,) | 468 | 471 | |
| L. & T. RR. Junction, <i>Lebanon and Tremont RR. Junction</i> , (46,) | 465 | 468 | |
| Annville, | 439 | 442 | 33 |
| Palmyra, | 452 | 455 | 38 |

| | | | |
|---|-----|-----|-----|
| Spring Creek, | 390 | 393 | |
| Hummelstown, | 373 | 376 | 44½ |
| Swatara Creek, | 366 | 369 | |
| Swatara Hills Summit, | 440 | 443 | 46½ |
| Rutherford's, | 426 | 429 | |
| Paxton, | 373 | 376 | 51 |
| Harrisburg, <i>West Line of Lebanon</i> | | | |
| Valley Depot, Harrisburg, (See | 318 | 321 | 54 |
| Table 1,) | | | |

TABLE 43.

LEBANON VALLEY RR.

(B.) From J. D. Steele's profile.

| STATIONS. | Above Tide. | Ocean Level. | |
|--------------------------------------|----------------|-----------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Harrisburg, (See Table 1,) | 314 | | |
| Hummelstown, | 362 | | |
| Palmyra, | 442 | | |
| Annaville, | 395 | | |
| Lebanon, | 460 | | |
| Myerstown, | 468 | | |
| Womelsdorf, | 440 | | |
| Reading, | 253 | | |
| Birdsboro', | 165 | | |
| Pottstown, | 137 | | |
| Phoenixville, | 97 | | |
| Norristown, | 58 | | |
| Manayunk Falls, | 51 | | |

NOTE.—This list was copied from a profile in the office of the Pennsylvania Canal Company, at Harrisburg, made under the direction of J. Dutton Steele, Civil Engineer, in 1857.

TABLE 44.
READING AND COLUMBIA RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Reading. |
|--|---------------------|---------------------|---------------------|
| Reading, (<i>See Table 35,</i>) | <i>Feet.</i> 265 | <i>Feet.</i> 268 | <i>Miles.</i> 0 |
| Sinking Springs, <i>Junction with the Lebanon Valley Road, (42,) .</i> | | | |
| Fritztown, | 345 | 348 | 6 |
| Deep Cut, <i>South Mountain Summit,</i> | 469 | 472 | 8 $\frac{1}{2}$ |
| Reinhold's, | 570 | 573 | 10 |
| Union, | 446 | 449 | 12 $\frac{3}{4}$ |
| Ephrata, | 396 | 399 | 15 $\frac{1}{4}$ |
| Rothville Summit. <i>This summit comes in somewhere between Ephrata and Landisville, . . .</i> | 381 | 384 | 19 $\frac{1}{2}$ |
| Litiz, | 405 | 408 | 24 $\frac{1}{2}$ |
| Manheim, | 360 | 375 | 27 $\frac{1}{4}$ |
| Sellers, | 399 | 402 | 32 |
| Lancaster Junction, | 379 | 382 | 33 $\frac{1}{2}$ |
| Landisville, <i>crosses Pennsylvania RR. on grade. It is given as 398 (405) in Table I, = a difference in the Ocean Level of (1) foot, .</i> | 395 | 378 | 34 |
| Bruckhart's, | 401 | 404 | 36 $\frac{1}{2}$ |
| Ironville, | 422 | 425 | 39 $\frac{1}{2}$ |
| Kauffman's, | | | 41 $\frac{1}{4}$ |
| Chestnut Hill Summit, | | | 41 $\frac{3}{4}$ |
| Mill Street, Columbia. <i>The Pennsylvania Ocean Level grade here is (251) at the depot on the street, lower down on the hill slope, . .</i> | 586 | 489 | |
| Columbia Depot, | 261 | 264 | 45 $\frac{3}{4}$ |
| | | 250 | |

PHILADA., Nov. 8, 1877.

CHAS. ALLEN, Esq.

DEAR SIR: Your favor of Sept. 20th was duly received. I beg to hand you the figures for the levels at Columbia, and also the levels of the various points upon the Quarryville Branch. You will observe that the elevation of our Railroad of 264 feet at Columbia is at Mill Street, while the elevation at our Depot, and a short distance below the Penna. R.R. Depot, is 250.4 feet.

Very respectfully,

W. LORENZ,
Chief Engineer.

TABLE 45.

LANCASTER AND QUARRYVILLE RR.

| STATIONS. | Ocean Level. | Distance. |
|---|--------------|------------------|
| | <i>Fect.</i> | <i>Miles.</i> |
| Junction with Lancaster Branch, | 371.5 | 0 |
| King St. at Stevens House, Lancaster, . . . | 312 | 1 |
| Conestoga Furnace, | 264 | |
| Harnish's Station, | 309 | |
| Summit near West Willow, | 474 | |
| West Willow Station, | 449 | 5 $\frac{3}{4}$ |
| Baumgardner's Station, | 384 | |
| Pequa Station, | 300 | |
| Summit near Lime Valley, | 389 | |
| Lime Valley Station, | 384 | |
| Beaver Creek Bridge, | 333 | |
| New Providence Station, | 401 | 12 $\frac{1}{2}$ |
| Cabean's Station, | 389 | 12 $\frac{3}{4}$ |
| Hess' Station, | 424 | |
| Quarryville, | 488 | 15 $\frac{1}{4}$ |

TABLE 46.

LEBANON AND TREMONT.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Lebanon. |
|---|--------------|--------------|---------------------|
| | <i>Fect.</i> | <i>Fect.</i> | <i>Miles.</i> |
| Lebanon, | 463 | 466 | 0 |
| Lebanon Junction, <i>Lebanon Valley RR., (See Table 42,)</i> | 465 | 468 | |
| Heilmansdale, | 512 | 515 | 4 |
| Bunker Hill, | 434 | 437 | 6 |
| Jonestown, | 419 | 422 | 7 $\frac{1}{2}$ |
| Union Forge, | 429 | 432 | 11 |
| Swatara Gap, | 444 | 447 | 13 $\frac{1}{2}$ |
| Murray, | 453 | 456 | 16 |
| Mifflin, | 487 | 490 | 19 |
| Irving, | 496 | 499 | 20 $\frac{1}{2}$ |
| S. & S. RR. Junc., <i>Schuylkill and Susquehanna RR., (See Table 50,)</i> | 516 | 519 | 23 $\frac{1}{2}$ |
| Pinegrove, | 517 | 520 | 24 |
| L. G. Ex. RR. Junc., <i>Lorberry Gap Extension RR.,</i> | 602 | 605 | |
| Tremont, (RR. Junc.,) <i>Mine Hill RR.; Lykens Valley RR.,</i> | 763 | 766 | 31 |
| Donaldson, | 907 | 910 | 39 |
| Kalmia Colliery, | 1234 | 1237 | |

TABLE 47.
LEBANON AND CORNWALL RR.

| STATIONS. | Mean Tide. | Ocean Level. |
|---|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Lebanon Junction, <i>Junction with Lebanon Valley RR. near Lebanon, (See Table 42,)</i> | 468 | 471 |
| Cumberland Street, | 449 | 452 |
| Cornwall Turnpike, | 462 | 465 |
| Killian's Road, | 558 | 561 |
| Plantation Road, | 558 | 561 |
| Furnace Run, | 563 | 566 |
| Cornwall, <i>opposite the Middle of the Ore Hill,</i> | 600 . | 603 |

NOTE.—The levels on the Cornwall Railroad were copied from a profile furnished by Mr. A. Wilhelm, President of the Company, and corrected by direction of Mr. Lorenz, to agree with P. and R. RR. levels.

Reading RR. datum, Mean Tide at Philadelphia. Add 3.349 feet for ocean level.

Lines have been surveyed south to Mount Hope, and to Manheim.

TABLE 48.
EAST PENN RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Reading. |
|--|--------------|--------------|---------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Reading, <i>Reading RR., (Table 35,)</i> | 265 | 268 | 0 |
| Temple, | 384 | 387 | 5 |
| Blandon, | 415 | 418 | 8 |
| Fleetwood, | 446 | 449 | 11½ |
| Lyons, | 468 | 471 | 15 |
| Bower's, | 451 | 454 | |
| Topton Junction, <i>Branch RR. to Kutztown, (See Table —,)</i> | 482 | 485 | 18½ |
| Mertztown, | 452 | 455 | |
| Shamrock, | 430 | 433 | 21½ |
| Alburtis Intersection, <i>Fogelsville RR.—Colebrookdale RR., (40,)</i> | 442 | 445 | 24 |
| Millerstown, | 380 | 383 | |

| | | | |
|--|-----|-----|----|
| Emaus Station, <i>Perkiomen RR.</i> , (See Table 39,) | 431 | 434 | 30 |
| Penn Junction, <i>Lehigh Valley RR.</i> , just below Allentown, where the 260 (263) elevation is supposed to apply, | 254 | 257 | 36 |
| Allentown, | | | |

TABLE 49.

LITTLE SCHUYLKILL RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Port Clinton. |
|---|---------------|--------------|--------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Port Clinton, <i>Reading RR.</i> , (Table 35,) | 407 | 410 | 0 |
| Dreherstown, | 491 | 494 | |
| Ringgold, | 555 | 558 | 10 |
| Hecla, | 587 | 590 | |
| Reynolds, | 660 | 663 | |
| Tamaqua, south side of Broad St.— Mountain Link and Schuylkill Valley RR.—East Mahanoy RR., Table 52 is a continuation of this table northward. | 800 | 803 | 20 |

TABLE 50.

SCHUYLKILL AND SUSQUEHANNA RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Auburn J. |
|--|---------------|-----------------|-------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Auburn Junction, <i>Reading RR.</i> , be- low Auburn Station, (Table 35,) | 463 | 466 | 0 |
| Jefferson, | 528 | 531 | 3 |
| Summit, | 723 | 726 | 7 |
| White Horse, | 609 | 612 | 12 |
| Stanhope, | 552 | 555 | 15 |
| Pinegrove Junction, | 517 | 520 | 18 |

| | | | |
|--|-----|-----|----|
| L. & P. R.R. Junction, <i>Lebanon and Tremont</i> , (See Table 46,) . . . | 516 | 519 | |
| Ellwood, | 670 | 673 | 24 |
| Gold Mine, | 796 | 799 | 26 |
| Rausch Gap, | 906 | 909 | 30 |
| Cold Spring, | 871 | 874 | 33 |
| Yellow Spring, | 774 | 777 | 35 |
| Rattling Run, | 689 | 692 | 38 |
| Forge, | 432 | 435 | 46 |
| Dauphin, <i>East side of the Susquehanna River</i> , | 346 | 349 | 51 |
| Rockville, <i>East side of the Susquehanna River, crossing Pennsylvania R.R. at grade, at east end of the long bridge, 5 miles above Harrisburg</i> , (See Table 1,) . . | 346 | 349 | 54 |
| Harrisburg, | 318 | 321 | 59 |

TABLE 51.

MINE HILL AND SCHUYLKILL HAVEN RR.

| STATIONS. | Mean Tide. | Ocean Level. | |
|--|---------------|-----------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Schuylkill Haven, <i>Junction with Philadelphia and Reading R.R.</i> , (See Table 35,) | 526 | 529 | |
| Westwood Junction, | 668 | 671 | |
| Tremont Summit, | 864 | 867 | |
| Tremont, | 763 | 766 | |
| Westwood Junction, as above, . . | 668 | 671 | |
| Minersville, | 697 | 700 | |
| Mine Hill Gap, | 827 | 830 | |
| Glen Carbon, | 1121 | 1124 | |
| Head of Mine Hill Plane, No. 1, . | 1524 | 1527 | |
| Foot of Gordon Plane, | 807 | 810 | |
| Potts Colliery, Locust Dale, . . . | 1091 | 1094 | |

TABLE 52.
CATAWISSA AND WILLIAMSPORT RR.
(A.) Official Resurvey.

| STATIONS. | | Elevation above Mid-Tide. | Distance. |
|---|--|---------------------------------|---------------|
| | | <i>Feet.</i> | <i>Miles.</i> |
| Door-sill, Tamaqua Depot, (<i>See Table 49; 56,</i>) | | 803.08 | 0 |
| Top of Rail at Mintzer's, | | 964.46 | |
| Do. Barnesville Station, | | 1064.09 | |
| Do. E. M. Junction, L. S. & E. M. RR., | | 1106.29 | 5½ |
| Do. Junction of N. J. C. RR., Tamanend, | | 1305.51 | |
| Do. Quakake Station, | | 1353.20 | 9 |
| Do. Summit Station, | | 1536.91 | 12 |
| Do. South end of Summit Tunnel, (Highest Point,) | | 1541.88 | |
| Do. Girard Manor Station, | | 1407.94 | 16 |
| Do. Brandonville Station, | | 1285.49 | 20½ |
| Do. Krebs' Station, | | 1225.31 | |
| Do. Ringtown Station, | | 1129.57 | 25 |
| Do. Ferndale Station, | | 1095.15 | |
| Do. Rarig's Station, | | 1039.99 | |
| Do. Beaver Valley water tank, | | 924.51 | 33 |
| Do. Shuman's Tunnel, | | 803.44 | |
| Do. McAuley Station, | | 759.46 | 38 |
| Do. South end of Mainville bridge, Danville, Hazleton & Wilkes- barre RR. crossing, | | 672.83 | 40½ |
| Do. Catawissa Station, | | 478.10 | |
| Do. Rupert Station, | | 476.98 | 47 |
| Do. Danville Station, | | 494.87 | 49 |
| Do. Waterman & Beaver's cross- ing, | | 494.02 | 56 |
| Do. Mooresburg Station, | | 483.45 | |
| Do. Pottsgrove Station, | | 618.47 | 63 |
| Do. P. & E. crossing, (Milton,) | | 489.10 | 68 |
| Do. Milton Station, | | 469.69 | |
| Do. New Columbia Station, | | 465.36 | 72 |
| Do. White Deer Station, | | 477.28 | 74 |
| Do. Allenwood Station, | | 476.19 | 77 |
| Do. P. & E. crossing, near Mont- gomery, | | 482.21 | 79 |
| Do. Montgomery Station, | | 491.24 | |
| Do. Seager's Station, | | 486.25 | 83½ |
| Do. Muncy Station, | | 511.82 | |
| | | 495 | 88½ |

| | | |
|--|--------|-----|
| Top of Rail at Hall's Station, | 512.70 | 91½ |
| Do. Montoursville Station, | 525.10 | 97 |
| Do. P. & E. crossing, Williams- port, | 531.16 | |
| Do. Williamsport Depot, * | 520.90 | 101 |
| Do. Lycoming Creek Bridge, | 529.17 | |
| Do. Frog connecting with Dodge & Co.'s tracks. Terminus of C. & W. Branch, | 529.31 | |

PHILADELPHIA, *December 20, 1877.*

CHAS. ALLEN, Esq.:

DEAR SIR: I have had test levels run over our Catawissa Branch, from Tamaqua to Williamsport, and beg to hand you report of same, and hope it may prove satisfactory.

Very respectfully,

W. LORENZ,
Chief Engineer.

TABLE 53.

CATAWISSA AND WILLIAMSPORT RR.

(B.) C. Allen and C. W. Ames.

| STATIONS. | Ocean Level. |
|---|--------------|
| | <i>Feet.</i> |
| Top of north rail, east line of station house, Catawissa, | 476.69 |
| Crossing of D. H. & W. RR. at Catawissa, . . . | 478.15 |
| Top of rail west line of station house, Rupert, . . . | 494.73 |
| Top of north rail east line of station, Danville, . . . | 494.7 |
| Crossing of P. & E. RR., just below Milton, | 469.435 |
| Top of rail west line of station house, Milton, | 465.135 |
| Top of rail north-east end of R.R. bridge, crossing the Susquehanna river at Milton, | 464.9 |
| Surface of water in river under bridge, | 435.7 |
| Bench mark on shale ledge, fifty feet west from south end of bridge, | 443.43 |
| Top of rail at Dateman's Station, | 469 |
| Do. New Columbia Station, | 477.15 |
| Do. White Deer, | 476 |
| Do. Allenwood, | 482.18 |
| Crossing P. & E. RR. near Montgomery, | 489.95 |
| Top of rail main track, west line of station house, Montgomery, | 485.1 |
| Top of rail north end of R.R. bridge, near Muncy, . . . | 496 |

| | |
|--|--------|
| Top of east rail north line of station, Muncy, | 494.51 |
| Top of rail, Hall's Station, | 512 |
| Do. Montoursville Station, | 524.5 |
| Do. east end of bridge crossing, Loyal Sock Creek, | 525.62 |
| Crossing P. & E. RR., Williamsport, | 531.25 |
| Top of rail, center of depot, Williamsport, * | 519.92 |

Elevations on the Catawissa and Williamsport RR., from the notes of Mr. Charles W. Ames, Second Geological Survey of Pennsylvania, May and June, 1877. Datum, Pennsylvania RR., at Harrisburg, 320.54 feet above Atlantic Ocean.

TABLE 54.
MILL CREEK RR.

| STATIONS. | Mean Tide Philad'a. | Ocean Level. | Dist. from Pottsville. |
|---|---------------------------|-----------------|---------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Pottsville, <i>Philadelphia and Reading RR., (See Tables 35; 50),</i> . . | 611 | 614 | 0 |
| Mount Carbon, <i>Philadelphia and Reading RR., (See Tables 35; 50),</i> | 603 | 606 | 1 |
| Mill Creek Junction, | 630 | 633 | 3 |
| Port Carbon Depot, (<i>Table 55,</i>) . . | 631 | 634 | 3½ |
| Dormer's, | 644 | 647 | 4 |
| St. Clair, | 749 | 752 | 5½ |
| Lanigan Furnace, | 714 | 717 | |
| John's Mines, | 802 | 805 | |
| New Castle, | 873 | 876 | 7 |
| Head of Grade, | 1476 | 1479 | 10½ |
| Frackville, | 1476 | 1479 | 11½ |

TABLE 55.
SCHUYLKILL VALLEY RR.

| STATIONS. | Mean Tide Philad'a. | Ocean Level. | Dist. from Pottsville. |
|--|---------------------------|-----------------|---------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Pottsville, <i>Philadelphia and Reading RR., (See Table 35,)</i> | 611 | 614 | 0 |
| Mt. Carbon, <i>Philadelphia and Reading RR., (Table 35,)</i> | 603 | 606 | 1 |

| | | | |
|--|-----|-----|-----|
| Port Carbon, <i>Junction with Schuylkill Valley RR., (Table 54,) . .</i> | 636 | 639 | 3½ |
| Eagle Hill, | 658 | 661 | 5 |
| Cumbola, | 665 | 668 | 5½ |
| New Philadelphia, | 687 | 690 | 7 |
| Middleport, | 721 | 724 | 9 |
| Brockville, | 775 | 778 | 11 |
| Tuscarora, | 906 | 909 | 13½ |
| Newkirk, | 909 | 912 | 15½ |
| Tamaqua, <i>Junction with Little Schuylkill RR., (Table 49,) . .</i> | 800 | 803 | 17½ |

TABLE 56.
EAST MAHANOEY RR.

| STATIONS. | Mean Tide Philad'a. | Ocean Level. | |
|---|---------------------------|-----------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Tamaqua, <i>End of Little Schuylkill RR. Catawissa and Williamsport RR. (Table 49; 52,) . . .</i> | 800 | 803 | |
| East Mahanoy Junction, (52,) . . | 1106 | 1109 | |
| Do. Tunnel, south end, . | 1322 | 1325 | |
| Do. do. north end, . | 1345 | 1348 | |
| Mahanoy City Depot, (Table 57,) . | 1240 | 1343 | |

TABLE 57.
MAHANOEY AND SHAMOKIN RR.

| STATIONS. | Mean Tide Philad'a. | Ocean Level. | Dist. from Ashland Depot. |
|---|---------------------------|-----------------|---------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Head of Grade, <i>south side Broad Mountain Summit,</i> | 1476 | 1479 | |
| Head of Mahanoy Plane, | 1482 | 1485 | |
| Foot of Mahanoy Plane, | 1129 | 1132 | |
| St. Nicholas Colliery, | 1160 | 1163 | |
| New Boston Colliery, | 1525 | 1528 | |
| Ashland Depot, | 856 | 859 | 0 |
| Ashland Summit, | 1160 | 1163 | |
| Keystone, | 1030 | 1033 | |
| Benjamin Franklin Colliery, . . . | 1180 | 1083 | |

| | | | |
|---|------|------|-----|
| Locust Summit, | 1243 | 1246 | |
| Montelier's Colliery, | 1077 | 1080 | |
| Coal Ridge Colliery, No. 2, | 1136 | 1139 | |
| Preston Colliery, No. 1, | 1095 | 1098 | |
| Cuyler Colliery, Raven Run, . . . | 1365 | 1368 | |
| Girardville, | 1018 | 1021 | |
| Shenandoah City Depot, | 1249 | 1252 | |
| Head of Big Mine Run Plane, . . . | 1280 | 1283 | |
| Locust Gap Junction, | 1034 | 1037 | 8½ |
| Greenback Colliery, | 900 | 903 | |
| Shamokin Depot, | 735 | 738 | 17 |
| Trevorton Colliery, | 765 | 768 | 24½ |
| Herndon Junction, <i>Junction with Northern Central R.W. at Herndon Station, thirteen and one-half miles from Trevorton. Elevation by Mr. Charles W. Ames at this station, 429.75. Pennsylvania R.R. datum,</i> | 428 | 431 | 38 |

NOTE.—There are scores of small branching colliery roads and tracks to coal mines not mentioned in the foregoing tables. Civil and mining engineers in the coal region are earnestly requested to furnish all the authentic levels of the intersections of such roads, levels of switches, levels of mouths of gangways, and levels of determinate recognizable points on the surface, high and low, in their possession, to make this portion of the hypsometrical records of Pennsylvania as complete and useful as possible. [J. P. I.]

TABLE 58.*
SCHUYLKILL CANAL.

| NAMES OF DAMS AND CANALS. | Lock No. | Ab. mean mid-tide, Del. Riv. | Ab. Ocean. | Towns. |
|-------------------------------|----------|------------------------------|--------------|---------------|
| | | <i>Feet.</i> | <i>Feet.</i> | |
| Fairmount dam, | | 10.523 | 13.87 | |
| Manayunk canals, | 69, 70 | 34.78 | 38.32 | Manayunk. |
| Flat Rock dam, | 68 | 36.24 | 39.58 | |
| Conshohocken canal, | 67 } | 46.01 | 49.35 | |
| Plymouth dam, | 66 } | | | |
| Norristown canal, | 65 } | 57.50 | 60.84 | Norristown. |
| Norristown dam, | 64 } | | | |
| Catfish dam, | 63 | 62.33 | 65.67 | |
| Pawling's dam, | 62 | 66.63 | 69.99 | Pt. Kennedy. |
| Oak's canal, | 61 | 83.40 | 86.74 | |
| Black Rock dam, | 60 | 84.75 | 88.09 | Phoenixville. |
| Vincent canal, | 59 | 101.71 | 105.05 | Rogers' Ford. |

| | | | | |
|---|-------|--------|--------|----------------|
| Vincent dam, | 58 | 102.21 | 105.55 | |
| { 1 m. lev., | 57 | 114.27 | 117.61 | |
| { 2 m. lev., | 56 | 125.16 | 128.50 | |
| Girard can., { 5 m. lev., | 54,55 | 143.49 | 147.03 | Pottstown. |
| { 8 m. lev., | 52,53 | 168.10 | 171.44 | |
| { 6 m. lev., | 51 | 176.57 | 179.91 | Birdsboro'. |
| Lewis' (Big Reading) dam, | 50 | 178.00 | 181.34 | |
| Poplar Neck, (Little Reading) dam, | 49 | 185.02 | 188.36 | |
| Reading can., (l. lev.) | 48 | 192.52 | 195.86 | Reading. |
| Read'g can., (up.lev.) | 46 | 198.52 | 201.86 | |
| Kissinger's dam, | 45 | 204.52 | 207.86 | |
| Shepp's dam, | 44 | 213.23 | 216.57 | |
| Leize's dam, | 43 | 221.60 | 224.94 | |
| Felix's dam, | 42 | 236.41 | 239.75 | |
| Duncan canal, | 39,40 | 264.59 | 267.93 | |
| Herbine's dam, | 38 | 266.09 | 269.43 | |
| { 4 lev., | 36,37 | 288.96 | 292.30 | Leesport. |
| Hamburg can., { 3 lev., | 34,45 | 311.86 | 315.10 | Mohrsville, |
| { 2 lev., | 33 | 324.36 | 327.70 | Shoem'krs'lle. |
| { 1 lev., | 31,32 | 352.96 | 356.30 | Hamburg. |
| Kernsville dam, | | 365.06 | 368.40 | |
| Blue Mountain dam, | | 389.96 | 393.30 | |
| Port Clinton canal, | | 400.26 | 403.60 | Port Clinton. |
| Hummel's dam, | | 409.16 | 412.50 | |
| Rishel's canal, | | 423.16 | 426.50 | |
| Lord's dam, | | 433.11 | 436.45 | Auburn. |
| Dam No. 13, | | 444.06 | 447.40 | |
| Dam No. 12, | | 451.36 | 454.70 | |
| Tunnel canal, | | 460.06 | 463.40 | |
| Dam No. 11, | | 471.66 | 475.00 | Landingville. |
| Dam No. 10, | | 477.06 | 480.40 | |
| Farquhar's canal, | | 483.46 | 486.80 | |
| Bower's dam, No. 8, | | 490.76 | 494.10 | |
| Lower level Schuyl. Haven canal, | | 497.16 | 500.50 | |
| Dam No. 7, | | 509.36 | 512.70 | Schuyl. Hav |
| Waterloo canal, | | 523.26 | 526.60 | |
| Dam No. 6, | | 551.51 | 554.85 | |
| Canal ab. Lock No. 8, | | 561.76 | 565.10 | |
| Dam No. 5, | | 574.49 | 577.83 | |
| Dam No. 4, | | 583.96 | 587.30 | |
| Canal ab. Lock No. 5, | | 592.36 | 595.70 | |
| Canal ab. Lock No. 4, | | 598.36 | 601.70 | Mt. Carbon. |
| Canal ab. Lock No. 3, | | 604.16 | 607.50 | Pottsville. |
| Dam No. 2, | | 613.96 | 617.30 | |
| Dam No. 1, | | 618.76 | 622.10 | Port Carbon. |

*Table showing the elevations of the water surfaces of dams and canals on the Schuylkill navigation, above mid-tide, Delaware River. (Connection made with mid-tide in the Delaware River, as follows:)

U. S. Coast Survey granite bench, Gloucester Ferry, N. J., opposite Philadelphia, is=8.10 feet above mean tide, Raritan Bay, or mean ocean level.

Philadelphia city datum=8.732 feet above mean tide, Raritan Bay, or mean ocean level.

Mid tide, Delaware River=3.349 feet above mean tide, Raritan Bay, or mean ocean level.

Mean mid-tide, Delaware River=3.349, or=0.000.

Philadelphia city datum=8.732, or=5.383 above mid-tide Del. River.

Fairmount dam, permanent comb as found August 8, 1876,=13.872, or=10.523 above mid tide, Del. River.

EDWIN F. SMITH,
Ch. Eng. of Canals.

PHILADELPHIA AND READING RAILROAD COMPANY,
CANAL DEPARTMENT,

READING, *September 16, 1876.*

MR. CHAS. ALLEN:

DEAR SIR: I send you by mail to-day the copy of "Levels of Penna." Since you obtained your list of heights on the Schuylkill navigation from the profile in this office, we have had a level taken of the difference in height between the combs of Fairmount dam and "city datum," Philadelphia, and have corrected the height at the different dams to correspond.

The new list of heights on the Susquehanna Canal is the result of a survey during the summer of 1875. The datum is mean mid-tide at Havre de Grace, as determined by the Philadelphia, Wilmington, and Baltimore RR., by a long series of observations previous to building the RR. bridge at that place. Mr. Larkin, Resident Engineer, informs me that two (2) feet is an ordinary tide; that is, two feet rise from low water to high water. Therefore, if *one foot* be added to our height at Columbia dam, so as to read from low water, Chesapeake Bay, or ocean level, instead of mid-tide, we will have $230.69+1=231.69$, and Penn'a RR., in front of passenger station,=251.61. The Penn'a RR. table gives height at Columbia, I presume, in front of passenger station, 251 above ocean level, from which, it would seem, that the two systems agree very nearly. . . . (See table 111.)

Yours truly,

EDWIN F. SMITH,
Chief Engineer Canals.

TABLE 58b.
Doubtful but published levels of certain towns.

| TOWNS. | Above Tide. | | |
|-----------------------------|-------------|--|--|
| Mount Carbon, | 620 | | |
| Schuylkill Haven, | 511 | | |
| Port Clinton, | 392 | | |
| Reading, | 195 | | |
| Pottstown, | 147 | | |
| Norristown, | 49 | | |

NOTE.—Levels as taken from a profile in the Pennsylvania Canal Co.'s Office, at Harrisburg, made under the direction of J. Dutton Steele, Civil Engineer, in 1857.

These levels do not agree with the levels on the Phila. and Reading RR.; for instance, the top of rail of RR. bridge at Schuylkill Haven Passenger Station, $523.30 + 3 = 526.30$, Ocean level. (E. F. S.)

TABLE 59.
UNION CANAL LOCKS.
East of Lebanon.

| No. of Lock. | Above tide. | Ocean level. | Dist. from Lebanon. |
|-----------------------|--------------|--------------|---------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Lock No. 1, | 475.5 | 494.5 | 3.59 |
| “ 2, | 471 | 490 | 3.96 |
| “ 3, | 466.5 | 485.5 | 4.42 |
| “ 4, | 462 | 481 | 4.86 |
| “ 5, | 457.2 | 476.2 | 5.01 |
| “ 6, | 453 | 472 | 5.37 |
| “ 7, | 447.5 | 466.5 | 5.98 |
| “ 8, | 440.5 | 459.5 | 6.36 |
| “ 9, | 433.5 | 452.5 | 6.37 |
| “ 10, | 427.5 | 446.5 | 7.26 |
| “ 11, | 421.5 | 440.5 | 7.61 |
| “ 12, | 414.5 | 433.5 | 8.16 |
| “ 13, | 407.5 | 426.5 | 9.00 |
| “ 14, | 401.5 | 420.5 | 9.45 |
| “ 15, | 395.5 | 414.5 | 10.05 |
| “ 16, | 387.5 | 406.5 | 10.44 |
| “ 17, | 379.5 | 396.5 | 11.34 |
| “ 18, | 373.5 | 392.5 | 11.88 |
| “ 19, | 368.5 | 387.5 | 12.37 |
| “ 20, | 362.5 | 381.5 | 12.63 |
| “ 21, | 356.5 | 375.5 | 13.24 |

| | | | |
|------------------------|-------|-------|-------|
| Look No. 22, | 351.5 | 370.5 | 13.78 |
| " 23, | 346.5 | 365.5 | 14.18 |
| " 24, | 340.5 | 359.5 | 14.91 |
| " 25, | 334.5 | 353.5 | 15.79 |
| " 26, | 328.5 | 347.5 | 16.45 |
| " 27, | 322 | 341 | 17.51 |
| " 28, | 315.5 | 334.5 | 17.71 |
| " 29, | 310.5 | 329.5 | 18.24 |
| " 30, | 305.5 | 324.5 | 19.46 |
| " 31, | 300.5 | 319.5 | 19.96 |
| " 32, | 295.5 | 314.5 | 20.65 |
| " 33, | 290.5 | 309.5 | 21.5 |
| " 34, | 285.5 | 304.5 | 22.14 |
| " 35, | 280.5 | 299.5 | 23.51 |
| " 36, | 275.5 | 294.5 | 24.39 |
| " 37, | 269.5 | 288.5 | 25.74 |
| " 38, | 264.5 | 283.5 | 25.89 |
| " 39, | 258.5 | 277.5 | 27 |
| " 40, | 253.5 | 272.5 | 27.89 |
| " 41, | 247.5 | 266.5 | 28.56 |
| " 42, | 241.5 | 260.5 | 29.99 |
| " 43, | 235.5 | 254.5 | 30.93 |
| " 44, | 230.5 | 249.5 | 32 |
| " 45, | 225.5 | 244.5 | 32.86 |
| " 46, | 220.5 | 239.5 | 34.29 |
| " 47, | 215.5 | 234.5 | 35.21 |
| " 48, | 210.5 | 229.5 | 36.15 |
| " 49, | 205.5 | 224.5 | 37.12 |
| " 50, | 200.5 | 219.5 | 37.62 |
| " 51, | 192.5 | 211.5 | 38.18 |
| " 52, | 187 | 206 | 39.45 |
| " 53, | 179 | 198 | 40.21 |
| " *54, | 169 | 188 | 41.53 |

| | Tide. | Ocean. |
|--|-------|--------|
| Lebanon, (or Summit Level Union Canal,) | 480 | 499 |
| Middletown, (Mouth of Swatara Creek,) | 266 | 285 |
| Reading, (Schuylkill River,) | 169 | 188 |
| Pinegrove, (Basin at former head of Navigation,) | 483½ | 502½ |

* This refers to surface of water in Schuylkill River, as seen above, and to the termination of the canal in the 1st dam below Reading, (*Poplar Neck*.) This dam is 185.02 above mid tide, and 188.36 above ocean. See Table 58.

EDWIN F. SMITH,
Chf. Engr. Schuylkill Canal.

In accordance with above note, 19 feet has been added to each elevation, to reduce Mr. Lehman's figures to ocean level, and this result agrees with the elevation of Pa. Canal at Middletown.

West of Lebanon.

| No. of Lock. | | Above tide. | Ocean level. | Dist. from Lebanon. |
|---|----------------------|--------------|--------------|---------------------|
| | | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Lock No. | 1, | 474.6 | 493.6 | 2.30 |
| " | 2, | 469.2 | 488.2 | 2.49 |
| " | 3, | 463.8 | 482.8 | 2.69 |
| " | 4, | 458.4 | 477.4 | 2.86 |
| " | 5, | 453 | 472 | 3.15 |
| " | 6, | 447.6 | 466.6 | 3.40 |
| " | 7, | 442.2 | 461.2 | 3.54 |
| " | 8, | 436.8 | 455.8 | 3.71 |
| " | 9, | 431.4 | 450.4 | 3.87 |
| " | 10, | 426 | 445 | 4 |
| " | 11, | 420.6 | 439.6 | 4.14 |
| " | 12, | 415.2 | 434.2 | 4.31 |
| " | 13, | 409.8 | 428.8 | 4.49 |
| " | 14, | 404.4 | 423.4 | 4.70 |
| " | 15, | 399 | 418 | 4.81 |
| " | 16, | 393.6 | 412.6 | 4.94 |
| " | 17, | 384.6 | 403.6 | 6.04 |
| " | 18, | 376.6 | 395.6 | 6.12 |
| " | 19, | 368.6 | 387.6 | 6.28 |
| " | 20, | 362.6 | 381.6 | 8.13 |
| " | 21, | 356.6 | 375.6 | 10.63 |
| " | 22, | 351.1 | 370.6 | 12.69 |
| " | 23, | 345.6 | 364.6 | 13.40 |
| " | 24, | 340.1 | 359.1 | 13.54 |
| " | 25, | 334.6 | 353.6 | 14.78 |
| " | 26, | 329.1 | 348.1 | 17.34 |
| " | 27, | 324.1 | 343.1 | 19.32 |
| " | 28, | 319.1 | 338.1 | 21.67 |
| " | 29, | 314.1 | 333.1 | 22.96 |
| " | 30, | 309.1 | 328.1 | 24.82 |
| " | 31, | 303.1 | 322.1 | 27.96 |
| " | 32, | 297.1 | 316.1 | 29.12 |
| " | 33, | 291.1 | 310.1 | 31.11 |
| " | 34, (At Middletown,) | 285.1 | 304.1 | 33.77 |
| Susquehanna River, } Mouth of Swatara Creek, } | | 266 | 285 | |

The elevations on the Union Canal were copied from a statement, giving number and lifts of locks, furnished through the kindness of Mr. B. B. Lehman, of Lebanon, Pa., formerly Chief Engineer and General Superintendent of the Union Canal.

III. LEHIGH RIVER SERIES.

TABLE 60.

NORTH PENNSYLVANIA RR.

| STATIONS. | City Datum. | Ocean Level. | Dist. from Philada. |
|--|----------------|--------------|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Philadelphia Depot, <i>at Willow Street,</i> | 19 | 28 | 0 |
| Cohocksink, | 25 | 34 | |
| Diamond Street, | 30 | 39 | |
| Somerset Street, | 69 | 78 | |
| P. & R. Coal RR. Crossing, <i>Crossing Philadelphia & Reading RR., (See Table 35.)</i> | 70 | 79 | |
| Tioga Street, | 94 | 103 | |
| Frankford Lane, | 92 | 101 | |
| Fisher's Lane, | 110 | 119 | |
| Green Lane, | 156 | 165 | |
| Oak Lane, | 192 | 201 | |
| City Lane, | 184 | 193 | 6 |
| York Road, | 176 | 185 | 7.4 |
| Chelton Hills, | 181 | 190 | 8 |
| Paxon's Road, | 225 | 234 | |
| Abingdon Junction, <i>Intersection of Northeast Pennsylvania RR. at Abingdon, (See Table 62.)</i> . . . | 245 | 254 | 9.5 |
| Edge Hill, | 284 | 293 | 11 |
| Camp Hill, | 169 | 178 | |
| Edgehillville Road, | 167 | 176 | |
| Fort Washington, | 161 | 170 | 14 |
| Ambler, | 190 | 199 | 15 |
| Pennllyn, | 230 | 239 | 17 |
| Gwynedd, | 262 | 271 | 18 |
| Wissahickon Creek, | 342 | 351 | |
| Lansdale Junc., <i>Doylestown Branch and Stony Creek RR. Crosses at Lansdale, (See Tables 63, 64.)</i> . | 359 | 368 | 22 |
| Hatfield, | 302 | 311 | 25 |
| Zetty's Road, | 339 | 348 | |
| Nigger Hill, | 443 | 452 | |
| Sellersville, | 322 | 331 | 31 |
| Tunnel, | 444 | 453 | |
| Koffler's Gap, | 521 | 530 | |
| Bunker Hill, | 519 | 528 | |
| Quakertown, | 487 | 496 | 38 |
| Hilltop, | 546 | 555 | 43 |
| Coopersburg, | 540 | 549 | 44 |

| | | | |
|--|-----|-----|----|
| Summit, <i>Highest Point noted on profile of North Pennsylvania RR. end of section 44, near Coopersburg, 591.50 + 9 = 600.50, Ocean level,</i> | 591 | 600 | |
| Koch's Mill, | 364 | 373 | |
| Yeager's Mill, | 339 | 348 | |
| Wagner's Mill, | 279 | 288 | |
| Hellertown, | 267 | 276 | 51 |
| Hampton, | 267 | 276 | |
| Shimersville RR., <i>Point of divergence of Shimersville Branch, (See Table 65,)</i> | 255 | 264 | |
| Hess' Mill, | 259 | 268 | |
| Zinc Works, | 238 | 247 | |
| Bethlehem, <i>the North Pennsylvania RR. intersects the Lehigh Valley RR. at this point,</i> | 228 | 237 | 55 |

The levels on the North Pennsylvania RR. were copied from the profile in the office of the Company, by permission of Mr. S. W. Roberts, Chief Engineer and General Superintendent.

The datum, or base of levels, is Philadelphia City datum, 8.733' above mean surface of Atlantic Ocean. *Therefore 9 feet is added to make the second column.*

A profile in the office of the Pennsylvania Canal Company, at Harrisburg, made under the direction of J. Dutton Steele, Civil Engineer, in 1857, gives the following very different levels of some of the points mentioned in the above list, and of others not mentioned in it. Some of the names seem to have been altered or reversed :

Wingohocking Creek, 92; Fisher's Lane, 110; City Line, 192; Edgehill, (York Road ?) 175; Edgehill, 284; Fort Washington, 158; Wissahickon, (Ambler ?) 190; Gwynedd, 229; North Wales, 377; Lansdale, 371; Nigger-Hill, 440; Sellersville, 311; Koffler's Gap, 524; Bunker Hill, 519; Quakertown, 489; Same's Gap, 597; Hellertown, 270; Bethlehem, 249.

The datum is "Tide."

TABLE 61.
NORTH PENNSYLVANIA RR.
Delaware River Division—(Bound Brook Route.)

| STATIONS. | Phil. City Datum. | Ocean Level. |
|---|----------------------|-----------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Jenkintown Junction, (60,) . . . | 194 | 203 |
| First mile post, | 198 | 207 |
| Second do. | 164 | 173 |
| Third do. | 129 | 138 |
| Crossing of Philadelphia and New- town RR., (86,) | 105 | 114 |
| Fourth mile post, | 105 | 114 |
| Bethayer's Station, $4\frac{1}{10}$ miles from Junction, | 105 | 114 |
| Water surface Pennypack Creek, . | 92 | 101 |
| Fifth mile post, | 128 | 137 |
| Sixth do. | 159 | 168 |
| Seventh do. | 154 | 163 |
| Somertown Station, $7\frac{3}{10}$ miles from Junction, | 147 | 156 |
| Eighth mile post, | 135 | 144 |
| Ninth do. | 119 | 128 |
| Tenth do. | 82 | 91 |
| Water surface, Neshanning Creek, | 16 | 25 |
| Eleventh mile post, | 66.5 | 75.5 |
| Twelfth do. | 70 | 79 |
| Thirteenth, Langhorn Station, . . | 87 | 96 |
| Fourteenth mile post, | 110 | 119 |
| Fifteenth do. | 131 | 140 |
| $15\frac{6}{10}$, Woodbourne Station, . . . | 136 | 145 |
| Sixteenth mile post, | 133.6 | 142.6 |
| Seventeenth do. | 134 | 143 |
| Eighteenth do. | 104 | 113 |
| Nineteenth do. | 92 | 101 |
| Twentieth, Yardley Station, . . . | 70 | 79 |
| Delaware River and Pa. Canal water surface, | 14 | 23 |
| Elevation of water surface Dela- ware river, | 2 | 11 |

The elevations on the Delaware River Branch of the North Pa. RR. are copied from a profile furnished by Mr. A. R. Roberts, Assistant Engineer North Pa. RR. Philadelphia city datum, 8.733 above ocean. "The end of the Delaware River Branch, North Pa. RR., (the first link of the Bound Brook route,) is the middle of the Delaware river, $20\frac{5}{10}$ miles from Jenkintown Junction." [A. R. ROBERTS.]

TABLE 62.
NORTH-EAST PENN. RR.

| STATIONS. | City Datum. | Ocean Level. | Dist. from Abington Junction. |
|---|----------------|-----------------|-------------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Abington Junction, (<i>Junction with the North Pennsylvania RR. near Abington, See Table 60,</i>) | 250 | 259 | 0 |
| Summit, | 333 | 342 | |
| Willow Grove, | 250 | 259 | 4 |
| Heaton, | | | |
| Pennepack Creek, | 160 | 169 | |
| Fulmore, | | | |
| Hatsborough, | 220 | 229 | 7 |
| Hartsville, | 233 | 242 | 10 |

The levels on the North-east Pennsylvania RR. were furnished by Mr. S. W. Roberts, Chief Engineer and General Superintendent, N. P. RR.

Base of levels, Philadelphia city datum, 8.733 above Ocean level. Therefore, nine feet is added to make second column.

TABLE 63.
DOYLESTOWN BR. N. PENN. RR.

| STATIONS. | City Datum. | Ocean Level. | Dist. from Lansdale Junction. |
|--|----------------|-----------------|-------------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Lansdale Junction, <i>Point of divergence from N. P. RR. at or near Lansdale, (See Table 60,</i>) . | 359 | 368 | 0 |
| Temperance Road, | 350 | 359 | |
| Neshaminy Creek, | 260 | 269 | |
| Road to Lexington, | 242 | 251 | |
| Cooke's Run, | 242 | 251 | |
| Bristol Road, | 294 | 303 | |
| Doylestown, <i>Depot Ground at Doylestown,</i> | 338 | 347 | 10 |

The elevations on the Doylestown Branch of the North Penn. RR. were furnished by Mr. S. W. Roberts, Chief Engineer.

Base of levels, Philadelphia City datum, 8.733 above Ocean level.

TABLE 64.
STONY CREEK Br. N. PENN. RR.

| STATIONS. | Above Assumed Datum. | Mean Tide. | Ocean Level. |
|---|----------------------------|---------------|-----------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Lansdale Junc., with North Penn RR. and with Doylestown Branch RR., (See Table 60,) | *350 | †359 | 362 |
| 1st Mile Post, | 350 | 359 | 362 |
| 2d Mile Post, | 330 | 339 | 342 |
| Summit, between Wissahickon and Stony Creek, . . | 350 | 359 | 362 |
| 1st Crossing of Stony Cr., . | 215 | 224 | 227 |
| 2d Crossing of Stony Cr., . | 142 | 151 | 154 |
| 3d Crossing of Stony Cr., . | 104 | 113 | 116 |
| Norristown, the level given in table 36, of the Philadelphia RR., Germantown and Norristown Branch, at Norristown, is 62 feet, (65 feet Ocean Level,) (See Table 36,) . . . | 50 | 59 | 62 |

* Elevation as shown in profile.

† Elevation of Railroad Crossing as shown on profile of North Penn. RR. Levels at the other stations of the table are made to correspond with the levels of North Penn. RR., by adding 9 feet to Mr. Roberts' original figures.

The levels on Stony Creek RR. were copied from a profile furnished through the kindness of Mr. A. R. Roberts, Assistant Eng., N. P. RR.

The datum was fixed on the assumption that the elevation of the water in the Schuylkill River pool *below* Norristown, stood 49' above Mean Tide at Philadelphia. The elevation of the comb of the dam at Norristown, as shown by the notes of the Schuylkill Navigation Company, at Reading, Pa., is 57.50' above mid tide at Philadelphia.

The third column is made by adding three feet (3.349) to reduce to Mean Tide at Philadelphia to Ocean Level.

TABLE 65.
SHIMERSVILLE N. P. RR.

| STATIONS. | Above Tide. | Ocean Level. | |
|---|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Junction, <i>point of divergence from N. P. RR. near Bethlehem, (See Table 60,)</i> | 255 | 258 | |
| Junction, <i>Junction with Lehigh Valley RR., (See Table 74,)</i> | 217 | 220 | |

TABLE 66.
LEHIGH AND SUSQUEHANNA RR.

| STATIONS. | Above Tide. | Distance. |
|---|--------------|---------------|
| | <i>Feet.</i> | <i>Miles.</i> |
| Phillipsburg, <i>Junction with Morris and Essex RR., (See Table 88,)</i> | 217.4 | |
| Easton, | 215.1 | |
| Glendon, | 215.06 | 2.3 |
| Hopes, | 219.51 | 6 |
| Freemansburg, | 221.73 | 9 |
| Bethlehem, | 235.54 | 12 |
| Bethlehem Junction, <i>with North Penna. and with Lehigh and Lackawanna RR.,</i> | 239.35 | |
| Allentown, | 257.23 | 17 |
| Lower Catasauqua, | 271.02 | |
| Upper Catasauqua, <i>Junction with Catasauqua and Fogelsville RR., (See Table 75,)</i> | 283.53 | 21 |
| Laubach's, | 303.82 | 23 |
| Seigfried's Bridge, | 315.03 | 24 |
| Treichlers, | 343.95 | 28 |
| Lockport, | 356.42 | 30 |
| Walnut Port, | 371.43 | 32 |
| Lehigh Gap, | 392.73 | 35 |
| Hazardville, | 416.83 | 36 |
| Bowmansville, | 435.77 | 39 |
| Parryville, | 443.33 | 40 |
| Weissport, | 475.50 | 42 |
| Lehighton, | 493.71 | 43 |
| Mauch Chunk, <i>Junction with Nesquehoning Valley Branch (68) and Mauch Chunk, Summit Hill and Switch Back RR., (67,)</i> | 532.3 | |
| Coal Port, | 584.7 | |
| Penn Haven Junction, | 708 | 53 |

| | | |
|---|--------|-----|
| Penn Haven, | 723.9 | |
| Rockport, | 882 | 61 |
| Sandy Run Junction, with Sandy Run Branch, (See Table 72,) | 1025 | |
| White Haven, Junction with Nescopeck Branch, (See Table 70,) | 1120 | |
| Penobscot, | ()? | 84 |
| Ashley, Junction with Nanticoke Branch, (See Table 71,) | ()? | 97 |
| Wilkesbarre,* | 550.03 | 100 |
| Pittston, | ()? | 109 |
| Moosic, | ()? | |
| Scranton, Junction with Delaware, Lacka- wanna and Western RR., (See Tab. 90,) | ()? | |
| Green Ridge, Junction with Delaware and Hudson RR., (See Table 96,) | ()? | 120 |

NOTE.—This road runs on the north and east bank of the Lehigh River most of the way. Its levels are similar to those of the Lehigh Valley road on the opposite bank.

Levels on the Lehigh and Susquehanna Railroad were furnished by Mr. John W. Crellin, Asst. Eng. All elevations are on top of rail.

* The elevation at the Wilkesbarre depot is from the level notes of Mr. Chas. W. Ames, June 28, 1877, and refers to Ocean level.

TABLE 67.

MAUCH CHUNK AND SWITCH BACK RR.

| STATIONS. | Tide. | Ocean Level. | Dist. from Mauch Chunk. |
|--|--------------|--------------|-------------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Mauch Chunk, (See Table 66,) | 532.3 | | 0 |
| Summit Hill, | 1348 | | 8½ |
| Length of Mount Pisgah, | | 2,322 | feet. |
| Height of Mount Pisgah, | | 664 | " |
| Distance from Mt. Pisgah to Mt. Jefferson, | | 6½ | miles. |
| Fall from Mt. Pisgah to Mt. Jefferson, | | 302 | feet. |
| Length of Mount Jefferson, | | 2,070 | " |
| Height of Mount Jefferson, | | 462 | " |
| Distance from Mt. Jefferson to Summit Hill, | | 1 | mile. |
| Fall from Mt. Jefferson to Summit Hill, | | 45 | feet. |
| Grade from Summit Hill to Mauch Chunk to the mile, | | 96 | " |
| Summit Hill above the Lehigh, | | 975 | " |
| Mount Pisgah above the Lehigh, | | 850 | " |
| Mount Pisgah above the tide, | | 1,500(?) | " |

TABLE 68.
NESQUEHONING VALLEY RR.

| STATIONS. | Tide. | Ocean Level. | Dist. from Mauch Chunk. |
|--|--------------|--------------|-------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Mauch Chunk, | 532.3 | | 0 |
| Nesquehoning, | 801.11 | | 5 |
| Hauto's, <i> Junction with Tamaqua Branch, (See Table 69,) . . .</i> | 1005.19 | | |
| Hometown, | 1175.64 | | 15 |
| Hawk Switch, | 1221.43 | | |
| Tamenend, | 1287.43 | | 18 |

TABLE 69.
TAMAQUA BRANCH RR.

| STATIONS. | Tide. | Ocean Level. | Dist. from Hauto's. |
|--|--------------|--------------|---------------------|
| | <i>Feet.</i> | | |
| Hauto's, (<i>See Table 68,</i>) | 1005.19 | | |
| Coledale, | 962.32 | | |
| Tamaqua, (<i>See Tables 49, 52,</i>) . . . | 787.50 | | |

TABLE 70.
NESCOPEC BRANCH RR.

| STATIONS. | Tide. | Ocean Level. | Dist. from White Haven. |
|---|--------------|--------------|-------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| White Haven, (<i>See Table 66,</i>) . . . | 1120 | | 8 |
| Upper Lehigh, | 1802 | | 8.7 |

Levels on the Nesquehoning Valley RR., Tamaqua Branch RR., Nescopec Branch, and Sandy Run Branch were furnished by Mr. John W. Crellin, Assistant Engineer L. & S. RR.

TABLE 71.
NANTICOKE BRANCH RR.

| STATIONS. | Tide. | Ocean Level. | Dist. from Ashley. |
|--|--------------|--------------|--------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Ashley, (<i>See Table 66,</i>) | 634.15 | | 0 |
| Sugar Notch, | 659.65 | | 1 |
| Hanover, | 654.05 | | 5 |
| Nanticoke, | 540 | | 6 |
| Wanamie, | 644.19 | | 8 |

Levels on the Nanticoke Branch RR. were obtained from Mr. Chas. Parrish, President of the road, Wilkesbarre, Pa.

TABLE 72.
SANDY RUN BRANCH RR.

| STATIONS. | Above Tide. | | |
|---|--------------|--|--|
| | <i>Feet.</i> | | |
| Sandy Run, (<i>See Table 66,</i>) | 1025 | | |
| Buck Mountain, | 1620 | | |
| Eckley, | 1663 | | |
| Jeddo, | 1618 | | |
| Drifton, | 1633 | | |

TABLE 73.
LEHIGH AND LACKAWANNA RR.

| STATIONS. | Mean Tide. | Dist. from Bethlehem Junction. |
|--|------------|--------------------------------|
| | | <i>Miles.</i> |
| Bethlehem Junction, with Lehigh and Susquehanna RR., at Bethlehem, on the north side of the Lehigh river, (<i>Table 66,</i>) | 240 | 0 |
| Peter's Mills, | 255 | |
| Shimer's, | 289 | 4 |
| Reiter, | 299 | 5 |
| Brodhead, | 313 | 6 |
| Steuben, | 333 | 8 |
| Clyde, | 362 | 10 |
| Bath, | 423 | 12 |
| Chapmansville, | 576 | 15 |
| Turnpike Summit in Wind Gap, Blue Mtn., | 978 | |

The elevations on the Lehigh and Lackawanna RR., were furnished by Mr. Charles Brodhead, President of the Company, who says, "Our surveys carry us into the *Wind Gap*; and the highest point on the Turnpike, *in the Gap*, we found to be 738 feet above Bethlehem, or 978 feet above tide." The road runs as far as Chapmansville, 15 miles.

TABLE 73b.

*Lehigh Canal Levels.**Additional Notes.*

By a printed list of levels in the possession of Mr. George Ruddle, of Mauch Chunk, it appears that there is a rise in the

| | |
|--|-------------------------|
| Lower grand section of Slackwater Navigation, from the Delaware River to Mauch Chunk, (46 miles,) of | <i>Feet.</i> 360'.87 |
| Upper grand section, Mauch Chunk to Wright's Creek, (26 miles,) of | 599'.83 |
| Upper grand section, Wright's Creek to Stoddart's Ville, (. . miles), of | 336'.00 |
| Adding to these figures, for the height of Bixler's Rift, Delaware Canal, above low tide in Delaware River | 160.40 |
| we get the following heights of the Lehigh Slackwater System: | |
| At Mauch Chunk, $360.87 + 160.40 =$ | 521.27 |
| At Wright's Creek, $521.27 + 599.83 =$ | 1121.10 |
| At Stoddart's Ville, $1121.10 + 336 =$ | 1457.10 |

TABLE 74.

LEHIGH VALLEY RR.

| STATIONS. | Mean high tide. Perth Amboy. | Ocean Level. | Dist. from Phillips- burg. |
|--|---------------------------------------|-----------------|----------------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Phillipsburg, 60' above Delaware River, Junction with Central RR. of N. J., Morris and Essex RR., Belvidere and Delaware RR., East end of Delaware bridge, (Table 83,) | 220 | | 0 |
| Delaware River, here, | 160 | | |
| Easton, | 210.5 | | |
| Redington, | 211.5 | | 7 |
| Freemansburg, | 225.9 | | 9 |
| Bethlehem, | 235.3 | | 12 |
| North Penn RR. Junction, (Table 60,) | 237 | | |

| | | | |
|---|--------|-----------|-----|
| East Penn RR. Junction, <i>Junction with East Penn RR. Elevation given by Philadelphia and Reading RR. at this point 254.257, (Table 48.)</i> | 250.8 | | 17 |
| Allentown, | 254 | | 17 |
| Catasauqua, (<i>See Table 75,</i>) | 282.5 | | 20 |
| Hokendauqua, | 294.9 | | 21 |
| Coplay, | 296 | | 22 |
| Whitehall, | 301.1 | | 24 |
| Laury's, | 329.2 | | 26 |
| Slatington, | 365.7 | | 33 |
| Lehigh Gap, | 389 | | 35 |
| Lehighton, | 465.6 | | 42 |
| Mauch Chunk, 40' above <i>Lehigh River, (See Table 67,)</i> | 544.4 | | 46 |
| Glen Onoko, | 591 | | 48 |
| Penn Haven Junction, (<i>See Tab. 76,</i>) | 705.5 | | 53 |
| Rockport, 35' above <i>Lehigh River,</i> | 906.5 | | 61 |
| Hickory Run, | 1016.5 | | 66 |
| White Haven, | 1143 | | 71 |
| Summit, <i>Nescopeck Mountain,</i> | 1728.5 | | 76 |
| Fairview, on the <i>Wyoming Mountain,</i> | 1673.5 | | 85 |
| Newport, | 1023 | | 92 |
| Warrior Run, | 716.5 | | 95 |
| Sugar Notch, | 666 | | 97 |
| South Wilkesbarre, | 546.5 | | 100 |
| Wilkesbarre, 30' above <i>Susquehanna River, (See bottom of this table,)</i> | 549 | | 101 |
| Plainsville, | 546.5 | | 105 |
| Pittston, (<i>See Table 78,</i>) | 571.5 | | 110 |
| Lackawanna Junction, 35' above <i>Susquehanna River, Junction with Delaware, Lackawanna and Western RR., (See Table 91,)</i> | 569.8 | | 111 |
| Ransom, | 579.2 | | 116 |
| Falls, | 587.3 | | 122 |
| McKune's, | 597.6 | | 126 |
| Lagrange, | 597.6 | | 129 |
| Tunkhannock, (<i>See Table 79,</i>) | 610.8 | | 133 |
| Vosburg, | 615.5 | | 138 |
| Mehoopany, | 634.5 | | 145 |
| Meshoppen, 35' above <i>Susquehanna River at Meshoppen,</i> | 643.9 | | 148 |
| Black Walnut, | 649 | | 153 |
| Laceyville, | 657.8 | | 156 |
| Wyalusing, | 674.2 | | 166 |

| | | | |
|--|-------|-----------|-----|
| Frenchtown, | 689.8 | | 172 |
| Rummerfield, | 696.2 | | 176 |
| Standing Stone, | 702 | | 179 |
| Wysauking, | 718.5 | | 183 |
| Towanda, 38' above Susquehanna River at Towanda, since dam is torn out, (See Table 80,) | 737.8 | | 187 |
| Ulster, | 742.8 | | 194 |
| Athens Bridge, | 778.8 | | 202 |
| Sayre, Junction with Geneva, Ithica and Athens R.R. and Southern Central R.R. | 773 8 | | 204 |
| Waverly Junction, 80' above Che- mung River. At Waverly joins the New York and Erie R.R., (Table 98,) | 824 | | 206 |
| Waverly, | 830 | | |
| Wilkesbarre, Opposite center of De- pot building, top of rail main track,* (See above,) | | 548.83 | |
| Lackawanna Junction, frog cross- ing, D., L. and W. R.R.,* | | 571.88 | |
| Lackawanna Junction Station,* | | 571.4 | |
| Plainsville, Top of rail north line of station house,* | | 547 | |

* Elevations of points on Lehigh Valley R.R. as determined by Mr. Chas. W. Ames, June, 1877. Datum, Pennsylvania R.R., Harrisburg, Pa.

The levels on the Lehigh Valley R.R. were copied from a list furnished by Mr. Robert H. Sayre, Chief Engineer and General Superintendent Lehigh Valley R.R., and revised and corrected by Mr. A. W. Stedman, Assistant Engineer. The datum is mean high tide, Staten Island Sound, Perth Amboy. All elevations are on top of rail.

LEHIGH VALLEY R.R. Co.,
WILKESBARRE, PA., Sept. 26, 1876.

CHAS. ALLEN, Esq.:

DEAR SIR: Your postal card of 9th inst. is received. I have nearly completed what changes are required in the elevations along the L. V. R.R. The former levels were run at separate periods, sometimes nearly five years intervening between the completion and the building of another stretch of road northward. It is not strange, therefore, that they are not entirely correct. The present levels were run from high tide, Perth Amboy, New Jersey, the present terminus of the road eastward to Lackawanna Junction. Mostly this year from there northward levels were used that were run in 1869.

On the Bloomsburg division of the D. L. & W. RR., their station,

Pittston, ocean level, 576

On the L. V. RR., same place, Lackawanna Junction, mean high tide, 570

Waverly, Erie RR., ocean level, 836

Waverly, L. V. RR., mean high tide, 830

I give you these specimens to show you that they nearly agree with the levels of two other roads. whose datum points were New York city and Delaware river. I have been looking over the levels of different lines that terminate on or touch Lake Erie. I see there is some variation.

Lake Erie, by Buffalo, N. Y., and Phila. RR., 573

Buffalo, by Buffalo, N. Y., and Phila. RR., 588

Buffalo, Erie RR. profile in my hand, (this 6 on original may have been an 8,) 569.7

Lake Erie, Erie RR. profile in my hand, Dunkirk, 582.2

Lake Erie, Profile N. Y. State Canals, 1874, 568.5

Buffalo, Niagara Falls, Br. Main street, 598.

I will, as soon as I have your copy ready, send it to R. H. Sayre, Chief Engineer, for his approval. He will, without doubt, forward it to you.

Yours truly,

A. W. STEDMAN,
A. Eng.

BETHLEHEM, PA., Oct. 14, 1876.

CHAS. ALLEN, Esq., Harrisburg, Pa.:

DEAR SIR: I send you, by same mail, a corrected copy of the levels on our roads.

Yours truly,

ROBT. H. SAYRE,
Supt. and Eng.

TABLE 75.

CATASAUQUA AND FOGELSVILLE RR.

| STATIONS. | Above Cat- asauqua. | Mean High Tide Perth Amboy. | Dist. from Catasau- qua. |
|--|------------------------|-----------------------------------|--------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Catasauqua, (<i>See Table 74,</i>) . . | 0 | 282.5 | 0 |
| Seiple's, | 183 | 465.5 | 3 |
| Jordan Bridge, <i>Water in Creek at</i> <i>Jordan Bridge, 81 feet above Cat-</i> <i>asauqua; 363.5 above Tide,</i> . . . | 165 | 447.5 | 4 |
| Guth's, | 209 | 491.5 | 5 |
| Walbert, | 268 | 550.5 | 6 |
| Chapman, | 259 | 541.5 | 9 |
| Trexlerstown, <i>Allentown RR. Cross-</i> <i>ing on grade, (See Table ,)</i> . . | 129 | 411.5 | 12 |
| Spring Creek, | 101 | 383.5 | 13 |

| | | | |
|--|-----|-------|----|
| Alburtis, <i>East Pennsylvania RR.</i> <i>Crossing on grade, (Tab. 48,) .</i> | 173 | 455.5 | 15 |
| Lock Ridge, | 158 | 440.5 | |
| Gardner, | 387 | 469.5 | |
| Red Lion, | 511 | 793.5 | |
| Rittenhouse Gap, | 658 | 940.5 | 20 |

The levels of the Catasauqua and Fogelsville RR. were furnished through the courtesy of Mr. Joshua Hunt, President of the Company.

The datum is Lehigh Valley RR. at Catasauqua, which is 582.5 above high tide; and therefore 282.5 above high tide, as shown in the second column.

TABLE 76.
HAZLETON AND OTHER Br. RRS.

| STATIONS. | Mean High Tide Perth Amboy. | Ocean Level. | Distance. |
|---|-----------------------------------|-----------------|---------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Penn Haven Junction, <i>with Lehigh Valley RR., (See Table ,)</i> . . | 705.5 | | 0 |
| Black Creek Junction, <i>Junction of the Beaver Meadow Division with the Quakake RR. or Mahanoy Division, (See Table 74.)</i> . . . | 1015 | | 16 |
| Weatherly, | 1090 | | 16 |
| Hazel Creek Junction, <i>of the Beaver Meadow Division with the Hazleton Division, (See below,)</i> . . . | 1325 | | |
| Hazleton, | | | 12 |
| Eckley, | | | |
| Hazel Creek Junction, <i>of the Beaver Meadow Division with the Hazleton Division, (See above,)</i> . . . | 1325 | | 0 |
| Beaver Meadow, | 1355 | | 5 |
| Lewiston, | | | |
| Jeanesville, | 1680 | | |
| Yorktown Crossing, <i>Divide between the Lehigh and Susquehanna waters,</i> | 1750 | | |
| Audenreid, | 1735 | 1738 | 17 |
| Hartz's, | | | 17 |

| | | | |
|---|-----------|-----------|----|
| Quakake Junction, <i>Catawissa R.R.</i> <i>Elevation (as given by Philadelphia and Reading R.R. at this point) 1352 feet above tide. The elevation of the Catawissa R.R. at Quakake, in table 52, we know to be correct, and we agree with the L. V. R.R. at Mahanoy City, their depot being ten feet lower than P. & R. depot at that point, Delano, Delano is on the divide between Schuylkill and Susquehanna waters,</i> | 1315 | | 19 |
| Mahanoy City Junction, | 1665 | | |
| Mahanoy City, (See Table 56,) . . | 1552 | | |
| Shenandoah, | 1230 | | 27 |
| Raven Run, | 1268 | | 30 |
| Centralia, <i>Centralia is on the divide between the Mahanoy and Shamokin waters,</i> | | | 35 |
| Mount Carmel, | 1484 | | 19 |
| Locust Gap, | 1056 | | 46 |
| Fulton, | 1027 | | |
| Shamokin, <i>Shamokin Station, 70' above the town,</i> | 960 | | |
| Zerbe Summit, <i>Zerbe Summit divides the Shamokin and Little Mahanoy waters,</i> | 730 | | |
| Zerbe Colliery, | 1073 | | |
| | 905 | | |

The elevations on the Branch Railroads, owned by the Lehigh Valley R.R., were furnished by Mr. Robert H. Sayre, Chief Engineer and General Superintendent.

The datum is mean high tide, Perth Amboy.

TABLE 77.
DANVILLE, HAZLETON AND W. R.R.

| STATIONS. | Profile. | Ocean Level. | Cor. Ocean Level. | Dist. from Sunbury Junction. |
|---|--------------|--------------|-------------------|------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Sunbury Junction, <i>Shamokin R.R. with Northern Central R.R. at Sunbury, (See Tables 109, 110,).</i> | 436 | 443 | 451 | 0 |
| Kline's Grove, | 438 | 445 | 453 | 5 |
| Wolverton, | 435 | 442 | 450 | 6 |

| | | | | |
|--|------|------|------|----|
| Kipp's Run, | 456 | 463 | 471 | 9 |
| Danville, with Lackawanna and Bloomsburg RR., (Table 92,) . | 456 | 463 | 471 | 12 |
| Roaring Creek, | 452 | 459 | 467 | 17 |
| Catawissa, (See Table 52,) | 463 | 470 | 478 | 21 |
| RR. Crossing, Catawissa RR. Crossing; elevation of Cata- wissa RR. at same point, 476, . | 463 | 470 | 478 | 27 |
| Mainville, | 582 | 589 | 597 | |
| Mifflin Cross-Roads, | 804 | 811 | 819 | |
| Scotch Valley, | 1008 | 1017 | 1025 | |
| Summit, | 1030 | 1037 | 1045 | |
| Wolfon, | 1016 | 1023 | 1031 | 38 |
| Rock Glen, | 914 | 921 | 929 | 40 |
| Gowan, | 992 | 999 | 1017 | |
| Tomhicken, with Lehigh Valley RR., (See Table 74,) | 1221 | 1228 | 1236 | 44 |

The elevations on the Danville, Hazleton and Wilkesbarre RR. were furnished by Mr. A. B. Starr, Assistant Engineer, P. & E. RR.

The datum is *high* tide at the Schuylkill River, at Philadelphia. Fifteen feet has been added to the original elevations, as given by Mr. Starr.

According to leveling by Mr. Charles W. Ames, May, 1877, the elevation at the Junction at Sunbury was found to be 450.9 above the Ocean, and as the same difference in the elevation was found to exist at the crossing of the Catawissa RR., near Catawissa Station, 8' has been added to the second column in the table for Ocean level.

TABLE 78.

PENN. COAL COMPANY'S RR.

| STATIONS. | | Profile. | Above Ocean. |
|--------------------------|--------|--------------|--------------|
| | | <i>Feet.</i> | <i>Feet.</i> |
| Foot of Plane, | No. 1, | | 567 |
| Head of Plane, | No. 1, | 108 | 675 |
| " " | " 2, | 206 | 773 |
| " " | " 3, | 246 | 813 |
| " " | " 4, | 397 | 964 |
| " " | " 5, | 495 | 1062 |
| " " (Dunmore) " 6, | " 6, | 550 | 1117 |
| " " | " 7, | 701 | 1268 |
| " " | " 8, | 888 | 1455 |
| " " | " 9, | 1077 | 1644 |
| " " | " 10, | 1255 | 1822 |
| Base of Plane, | " 11, | 1217 | 1784 |

Loaded track going
out from Pittston.

| | | | |
|---|---------|------|------|
| Tunnel, Head of; | No. 11, | 1400 | 1967 |
| Base of Plane, | " 12, | 779 | 1346 |
| Head of Plane, | " 12, | 929 | 1496 |
| Hawley, (<i>See Table 95,</i>) | | 329 | 896 |
| Head of Plane, | No. 13, | 511 | 1078 |
| " " | " 14, | 640 | 1207 |
| Empty track back to Port Griffith's. | " 15, | 733 | 1300 |
| " " | " 16, | 830 | 1397 |
| " " | " 17, | 874 | 1441 |
| " " | " 18, | 955 | 1522 |
| " " | " 19, | 998 | 1565 |
| " " | " 20, | 952 | 1519 |
| " " | " 21, | 1040 | 1607 |
| " " | " 22, | 226 | 793 |
| Foot of Plane, | " 22, | 64 | 631 |

Elevations on the Pennsylvania Coal Company's RR. from Pittston, (or Port Griffith,) to Hawley were copied from a profile in the Company's office at Pittston, Pa., by permission of Mr. George Johnson, Engineer.

The datum is 0 at foot of Plane No. I = 567.28 above Sea Level.

TABLE 79.
MONTROSE RR.

| STATIONS. | Mean High tide. | Dist. from Tunkhan- nock. |
|--|--------------------|---------------------------------|
| | <i>Feet.</i> | <i>Miles.</i> |
| Tunkhannock, <i>junction with Lehigh Valley RR.,</i> (<i>See Table 74,</i>) | 611 | 0 |
| Marcy, | 965 | |
| Lemon, | 1041 | |
| Avery, | 979 | |
| Meshoppen Creek, | 933 | |
| Lynn, | 1032 | 9 |
| Springville, | 1257 | 14 |
| Tylersville, | 1400 | |
| Dimock, | 1507 | 17 |
| Hunter's, | 1547 | |
| Cool's, | 1547 | |
| Allenville, | 1649 | |
| Montrose, | 1656 | 28 |

Elevations on the Montrose Railway were furnished by Mr. James I. Blakslee, President of the Company.

The datum, or base of levels, is that of grade on the Lehigh Valley RR. at Tunkhannock. Mean High tide, Perth Amboy.

TABLE 80.
BARCLAY RR.

| STATIONS. | Mean High Tide, Perth Amboy. | Ocean Level. | Dist. from Towanda. |
|--|---------------------------------------|--------------|------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Towanda, <i>Switch at Upper Depot,</i> (<i>See Table 74,</i>) | 738 | | 0 |
| Towanda, <i>Barclay Depot,</i> | 725 | | |
| Monroeton Junction, <i>With State</i> <i>Line and Erie RR., (Table 82,)</i> | 762 | | 4 |
| Masontown, <i>Barclay RR. Bridge,</i> <i>top of rail,</i> | 794 | | 4.5 |
| Greenwood, | 823 | | 6 |
| Lamoka, | 1042 | | 11 |
| Foot of Plane, <i>Elevation estimated,</i> | 1271 | | 14 $\frac{1}{2}$ |
| Head of Plane, <i>Rail in Plane-house,</i> | 1756 | | 16 |

Elevations on the Barclay and Schrader RR's were furnished by Mr. A. W. Stedman, Engineer of the Pa. & N. Y. RR. and Coal Co., at Towanda, Pa., through the solicitations of Mr. James Macfarlane.

The datum is Mean High Tide at Perth Amboy.

TABLE 81.
SHRADER RR.*

| STATIONS. | Mean High Tide, Perth Amboy. | Ocean Level. | Dist. from RR. Switch. |
|--|---------------------------------------|--------------|------------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| RR. Switch, <i>Upper Switch con-</i> <i>necting with Barclay RR.,</i> . . . | 1801 | | 0 |
| RR. Switch, <i>Lower Switch connect-</i> <i>ing with Barclay RR.,</i> | 1788 | | |
| Carbon Run, <i>Rail under Breaker</i> <i>is 1923.'—1929,</i> | 1929 | | |
| Lowest Point, <i>Lowest Point of Coal</i> <i>near Breaker,</i> | 1976 | | |
| Summit of Carbon Run, | 2041 | | 4 |

* This Railroad, four miles long, connects the Barclay RR. with the Schrader Coal Mines.

TABLE 82.
STATE LINE AND SULLIVAN RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Monroeton Junction. |
|---|---------------|--------------|--------------------------------------|
| | <i>Fect.</i> | | <i>Miles.</i> |
| Monroeton Junction, <i>With Barclay</i> <i>RR, (See Table 80,)</i> | 762 | | 0 |
| Wilcox, | 1123 | | 7 |
| New Albany, | 1197 | | 9 |
| Miller's, | 1330 | | 11 |
| Bushore, (?) | 1593 | | 16 |
| Bernice, | 1858 | | 24 |

Levels on the State Line and Sullivan RR. were copied from a profile in the office of the Company at Towanda, Bradford County, Pa. There were no stations, or names of towns, noted on the profile, the elevations being marked at mile posts, and, therefore, the stations have been located from J. A. Anderson's RR. map. The levels as shown in this list may not be entirely correct; but it is the only record which could be found.

The datum is Mean High Tide at Perth Amboy.

IV. DELAWARE RIVER SERIES.

TABLE 53.

PHILADELPHIA AND TRENTON RR.

| STATIONS. | Mean tide. | Ocean level. | Dist. from Philada. |
|---|---------------|--------------|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Philadelphia, | | | 0 |
| Kensington, <i>Frankford Road cross- ing</i> , | 29 | 32 | |
| Bridge over Frankford Creek, . . | 24 | 27 | |
| Frankford Station, <i>middle of Church Street</i> , | 29 | 32 | 3 |
| Bridesburg, <i>middle of Bridge Street</i> , . | 29 | 32 | 4 |
| Tacony, | 31 | 34 | 6 |
| Bories, | 32 | 35 | 11 |
| Cornwell's, | 36 | 39 | 13 |
| Eddington, <i>Dunk's Ferry Road</i> , . . | 39 | 42 | 14 |
| Bristol, <i>Middle of Market Street</i> , . | 18 | 21 | 18 |
| Tullytown, | 17 | 20 | 22 |
| Penn Valley, | 18 | 21 | 26 |
| Morrisville, <i>N. E. side of Washing- ton Street</i> , | 31 | 34 | 29 |
| Trenton Junction, <i>the railroad track is four feet above the water in the canal</i> , | 60 | 63 | 30 |
| Washington's Crossing, | 64 | 67 | 43 |
| Prime Hope Saw Mills, (<i>Tab. 84</i>), . | | | |
| Lambertville, | 72 | 75 | 50 |
| Prallsville, | 83 | 86 | 54 |
| Bull's Island, <i>Elevation of railroad, head of Bull's Island, 97'. Low water in Delaware River, 74'</i> , . . | 94 | 97 | 56 |
| Warford's Rock, (<i>See Table 84</i>), . . | | | |
| Frenchtown, | 125 | 128 | 65 |
| Milford, | 137 | 140 | 69 |
| Holland, (<i>See Table 84</i>), | | | 72 |
| Reigelsville, | 163 | 166 | 76 |
| Carpenterville, | 175 | 178 | 79 |
| Phillipsburg, <i>Lehigh Valley R.R., (See Table 74)</i> , | 195 | 198 | 84 |
| Martin's Creek, | 231 | 234 | 91 |
| Belvidere, | 268 | 271 | 98 |
| Manunka Chunk, | 320 | 323 | 101 |
| Walker's Ferry Water Gap, (<i>84</i>), . | | | |

Levels on the Philadelphia and Trenton and Belvidere Division of the Pennsylvania R.R. were furnished by Mr. Thomas B. Fidler, Engineer in the office of the company at Trenton, N. J. The levels were deduced from the original table of grades by Samuel H. Kneass, Engineer.

The datum of the Trenton and Philadelphia R.R. is mean tide at Philadelphia. The datum of the Belvidere Division of the Pennsylvania R.R. is mid-tide in the Delaware River, junction of feeder with Delaware and Raritan Canal, near Trenton. Water level is four feet below the railroad track.

TABLE 84.
DELAWARE RIVER LEVELS.

| STATIONS. | Mean tide. | Ocean level. |
|---|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Trenton, | | |
| Washington's Crossing, | 20 | 23 |
| Prime Hope Saw Mills, | 35 | 38 |
| Lambertville, | 49 | 52 |
| Bull's Island, | 71 | 74 |
| Point Pleasant, | 73 | 76 |
| Warford's Rock, | 91 | 94 |
| Frenchtown, | 104 | 107 |
| 1.7 miles above Frenchtown, <i>Hunterdon</i> <i>county, N. J., 31.7 miles above Trenton,</i> | 107.7 | 111 |
| Milford, | 111 | 114 |
| 4 miles above Milford, <i>Hunterdon county,</i> <i>N. J.,</i> | 121.8 | 125 |
| Holland, | 116 | 119 |
| 1½ miles below Reigelsville, | 124.2 | 127 |
| Reigelsville, | 127 | 130 |
| ¾ mile above Reigelsville, | 130 | 133 |
| 1.6 mile above Reigelsville, | 133.8 | 137 |
| Carpenterville, | 137 | 140 |
| 2½ miles below Phillipsburg, <i>opposite East-</i> <i>on, in New Jersey,</i> | 148.6 | 151 |
| Phillipsburg, | 157 | 160 |
| 1¾ miles above Phillipsburg, | 165.2 | 168 |
| 2.7 miles above Phillipsburg, | 170.4 | 173 |
| 7.6 miles above Phillipsburg, | 192.8 | 196 |
| 2.84 miles above Martin's Cr., <i>above Easton,</i> <i>in Pennsylvania,</i> | 200.4 | 204 |
| 4.14 miles above, | 210.9 | 214 |
| Belvidere, | 232 | 235 |
| Manunka Chunk, | 262 | 265 |
| Walker's Ferry, at Delaware Water Gap, . | 298 | 301 |

NOTE.—The datum of the above is mean tide, Delaware River, (3.349 above mean ocean level.) Levels were obtained in the office of the Philadelphia and Trenton R.R. at Trenton, from Mr. Thomas B. Fidler, C. E.

TABLE 85.
DELAWARE RIVER CANALS.

| POINTS ON LINE OF CANAL. | LOW TIDE. | |
|--|-----------|---------|
| | Feet. | Inches. |
| Trenton Falls; head; 49 miles below the mouth of Lehigh River, | 9 | 8 |
| Gould's Rift; head, | 16 | 8 |
| Yardleyville, | 18 | |
| Scudder's Rift; head, | 24 | 8 |
| Taylor's Rift; head, | 33 | 6 |
| Buck Tail Rift; head, | 36 | 5 |
| Will's Falls; head, | 49 | 9 |
| New Hope, | 50 | |
| Thirty-three miles below Lehigh River, | 53 | 3 |
| Green Banks Rift; head, | 58 | 9 |
| Gallopen's; head, | 68 | 3 |
| Bull's Falls; head, | 72 | 2 |
| Twenty-six miles below Lehigh River, | 72 | 9 |
| Cut Bite Rift; head, | 77 | 4 |
| Tumbling Dam Falls; head, | 89 | 1 |
| Marshal's Island Rapids; head, | 100 | 7 |
| Man of War Rift; head, | 102 | 3 |
| Stunt's Falls; head, | 107 | 2 |
| Firman's Falls; head, | 110 | 11 |
| Nockamixon Falls; head, | 117 | 6 |
| Linn's Falls; head, | 124 | 10 |
| Eleven miles below Lehigh River, | 126 | 10 |
| Ten miles below Lehigh River, | 127 | 3 |
| Durham Falls; head, | 130 | 3 |
| Nine miles below Lehigh River, | 130 | 4 |
| Greavelly Falls; head, | 133 | 3 |
| Rocky Falls; head, | 136 | 1 |
| Ground Hog Rift; head, | 138 | 1 |
| Old Sow Rift; head, | 145 | 7 |
| Clifford's Rift; head, | 150 | 10 |
| Bixler's Rift; head. <i>This point is about one half mile below the mouth of Lehigh River,</i> | 160 | 5 |

Elevations on the Delaware Canal were copied from a map made under the direction of the Lehigh Coal and Navigation Company, in 1826, by Isaac A. Chapman. The map is in possession of Mr. George Ruddie, Mauch Chunk.

The datum is low tide, Delaware River, 3.349 above Ocean level.

TABLE 86.
PHILADELPHIA AND NEWTOWN RR.

| STATIONS. | Elevation. | Ocean Level. | Distance. |
|------------------------------------|--------------|--------------|---------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Point of frog on Connecting RR., . | 93.5 | 103 | 0 |
| Crescentville, | 85.5 | 95 | 2.96 |
| Foxchase, | 190.5 | 200 | 5.92 |
| Huntingdon Valley, | 108 | 117.5 | 8.76 |
| Southamptonville, | 230 | 239.5 | 13.68 |
| Summit of Line, | 234 | 243.5 | 13.82 |
| Churchville, | 175 | 184.5 | 15.58 |
| Newtown, | 135 | 144.5 | 20.69 |

The levels on the Philadelphia and Newtown RR. were furnished by Mr. J. P. Hutchinson, C. E., of Newtown, Bucks county, Pa., and have been reduced to Ocean level by adding 9.5 feet to each elevation, as given by Mr. Hutchinson. Mr. A. R. Roberts, Assistant Engineer of the North Penna. RR., has kindly furnished the elevation at the point where the Connecting (Pa.) RR. crosses the North Pa. RR. as 94 feet above Philadelphia city datum, which is 8.733 (or, in round numbers, 9 feet) above Ocean. Mr. Hutchinson is .5 low, therefore, 9.5 feet, as above stated, has been added to the heights as given by Mr. Hutchinson.

NOTE.—The Connecting RR. runs around the city of Philadelphia.

NEWTOWN, *January 1, 1877.*

CHAS. ALLEN, Esq.:

DEAR SIR: In reply to your favor, I would say that, having been disconnected from the Newtown RR. for nearly two years, and the notes and papers having passed out of my hands, I am unable to give you as full information as I would desire. From such notes as I now have, I cannot give you the tide levels of any part of the line, what I send being merely the relative heights and distances of different points, (principal stations,) beginning with the point of frog at the junction of this line with the connecting RR., which junction is about 125 feet eastward of the crossing of the Connecting RR. with the North Penna. RR. This is the best that I can do, and if you have the *tide elevation of this crossing* a very close approximation can thus be arrived at for the elevations on the Newtown road.

Yours, &c.,

J. P. HUTCHINSON.

TABLE 87.
FLEMINGTON RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Flemington Junction. |
|--|--------------|--------------|---------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Flemington Junction, <i> Junction with Belvidere and Delaware RR., (See Table 83,)</i> | 73 | 76 | 0 |
| Mount Airy, | 147 | 150 | 3 |
| Ringoes, | 248 | 251 | 6 |
| Summit, <i>N. E. of Ringoes,</i> . . . | 255 | 258 | |
| Copper Hill, | 159 | 162 | 9 |
| Flemington, | 183 | 186 | 12 |

Levels on the Flemington RR. were copied from a list prepared by Mr. Thomas B. Fidler, in the RR. office at Trenton, N. J.

The datum is mean tide Delaware River=3.349 above Ocean level.

TABLE 88.
MORRIS AND ESSEX RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Phillipsburg. |
|--|--------------|--------------|--------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Phillipsburg, (<i>See Table 83,</i>) . . . | 217 | 220 | 0 |
| Phaleony Creek, | 341 | 344 | |
| Stewartsville, | 370 | 373 | 5 |
| Washington Depot, | 503 | 506 | 14 |
| Port Murray, | 585 | 588 | 17 |

The Morris and Essex RR. levels were furnished by Mr. James Archbald, Chief Engineer, Del. L. & W. RR.

TABLE 89.
NEWTON AND BELVIDERE RR.

| STATIONS. | Mean Tide. | Ocean Level. | |
|--|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| RR. Junction, <i> Junction with B. D. RR., (See Table 83,)</i> | 272 | 275 | |
| Belvidere, | 283 | 286 | |
| Sarepta, | 361 | 364 | |
| Hope, | 448 | 451 | |

| | | | |
|--------------------------------|-----|-----|--|
| Howell P. O., | 562 | 565 | |
| Summit, | 595 | 598 | |
| Johnsburg, | 568 | 571 | |
| Summit of RR. route, | 628 | 631 | |
| Newton, | 607 | 610 | |

NOTE.—The Newton and Belvidere levels were copied from a list furnished by Mr. Thomas B. Fidler, Trenton, N. J.

The other two short lists in New Jersey are given above, on account of their connections with the Delaware River lines. Other New Jersey Railway levels are published by Prof. Cook, in his Annual Reports of the Geological Survey of that State.

TABLE 90.

DELAWARE, LACKAWANNA AND WESTERN RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from M. Chunk. |
|--|----------------|-----------------|-------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Junction, (Central RR. of N. J.,) | | | |
| Washington, (Morris & Essex RR.,) | | | 0 |
| Oxford Furnace, | | | |
| Bridgeville, | | | |
| Manunka Chunk, (<i>See Table 83,</i>) . | | | |
| Delaware Bridge, | 290 | 293 | 2 |
| Portland, | 288 | 291 | |
| Delaware Water Gap, | 316 | 319 | 10 |
| Stroudsburg, | 400 | 403 | 14 |
| Spragueville, | 487 | 490 | |
| *Henryville, | 593 | 596 | |
| *Oakland, | 1008 | 1011 | 27 |
| *Paradise, | 1518 | 1521 | |
| Forks, | | | |
| Tobyhanna, <i>The highest point noted on the profile, 1970 feet above tide. This point is between Tobyhanna and Lehigh Summit,</i> | 1929 | 1932 | 40 |
| Gouldsboro', | | | 46 |
| Summit, | 1887 | 1890 | |
| *Moscow, | 1555 | 1558 | 54 |
| *Dunning's, | 1397 | 1400 | |
| Greenville, | 1182 | 1185 | |
| Scranton, (<i>See Tables 91 and 92,</i>) . | 740 | 743 | 67 |
| Clark's Summit, | 1239 | 1242 | |

| | | | |
|--|------|------|-----|
| Abington, | 1055 | 1058 | 77 |
| Factoryville, | 917 | 920 | 82 |
| Tunnel, | 963 | 966 | |
| Nicholson, | 766 | 769 | 88 |
| Hopbottom, | 890 | 893 | |
| Foster, | | | 94 |
| Oakley's, | 942 | 945 | |
| Montrose Station, | 1050 | 1053 | 101 |
| New Milford, | 1084 | 1087 | 108 |
| Great Bend, | 876 | 879 | 114 |
| State Line, | 860 | 863 | |
| Corbettsville, | 852 | 855 | |
| Conklin, | 849 | 852 | |
| Binghamton, (<i>See Table 98,</i>) . . . | 843 | 846 | 128 |

* Elevations at stations marked thus (*) were not marked on the profile; neither could it be exactly determined what was the vertical scale of the profile; but it was supposed to be 290 feet to the inch.

Elevations on the D., L. & W. R.R. were copied from a profile in the office of the company at Scranton, by permission of the Assistant Engineer, Mr. Bryson.

The datum is mean tide, Delaware river, = 3.349 above Ocean level.

The following list is interesting, some of its figures corresponding exactly with those given above. It was obtained from a profile in the office of the Pennsylvania Canal Co. at Harrisburg, made under the direction of J. Dutton Steele, in 1857.

TABLE 90b.

| STATIONS. | Above Tide. | Ocean Level. | |
|-------------------------------|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| White House, | 170 | 173 | |
| Lebanon, | 274 | 277 | |
| Clinton, | 326 | 329 | |
| New Hampton Summit, | 505 | 508 | |
| West End Switch, | 498 | 501 | |
| Delaware Bridge, | 293 | 296 | |
| Delaware Water Gap, | 314 | 317 | |
| Stroudsburg, | 422 | 425 | |
| Naglesville, | 1961 | 1964 | |
| Greenville, | 1182 | 1185 | |
| Scranton, | 739 | 742 | |

TABLE 91.
DELAWARE, LACKAWANNA AND WESTERN RR.
Bloomsburg Division.
(A.) Official Levels.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Scranton. |
|--|--------------|--------------|----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Scranton, (<i>See Table 90,</i>) | 740 | 743 | 0 |
| Taylorville, | 683 | 686 | |
| Lackawanna Junction, | 573 | 576 | 6 |
| Pittston, | 573 | 576 | 9 |
| West Pittston, | 580 | 583 | 10 |
| Wyoming, | 560 | 563 | |
| Maltby, | 560 | 563 | |
| Kingston, | 551 | 554 | 17 |
| Plymouth Junction, | 545 | 548 | 19 |
| Plymouth, | 539 | 542 | 20 |
| Avondale, | 534 | 537 | |
| Nanticoke, | | | 24 |
| Hunlock's Creek, | | | 27 |
| Schickshinny, | | | 32 |
| Beach Haven, | | | 41 |
| Berwick, | | | 43 |
| Briar Creek, | | | 47 |
| Espey, | | | 54 |
| Bloomsburg, | | | 56 |
| Rupert, | | | 58 |
| Catawissa Bridge, | | | 60 |
| Danville, | | | 68 |
| Northumberland, | | | 80 |
| Sunbury, | | | 82 |

Elevations of the Bloomsburg Division of the Delaware, Lackawanna and Western RR. were copied from notes, in the possession of Mr. A. Bryson, Jr., Div. Engineer, at Scranton, Pa. This list contains all the levels that could be obtained of this road.

TABLE 92.
(B.) *Allen and Ames' Survey, 1877.*

| STATIONS. | Ocean Level. | Dist. from Scranton. |
|--|--------------|-------------------------|
| | <i>Feet.</i> | <i>Miles.</i> |
| Scranton, <i>N. W. line of Passenger Depot, top of near rail, (See Tables 90, 91,)</i> | 739.2 | 0 |
| Bellevue, | 722.81 | 1.4 |
| Taylorville, | 683.37 | 3 |
| Lackawanna, | 637 | 5 |
| Crossing Pleasant Valley Branch L. V. RR. <i>near Lackawanna Station, (Table ,)</i> | 583.17 | |
| Pittston, | 572 | |
| L. V. RR. track, Lackawanna Junction Sta- tion, | 571.4 | 6 |
| Frog at Crossing of L. V. RR. and L. & B. RR., Lackawanna Junction, | 571.88 | |
| Pittston, <i>top of rail west end of bridge cross- ing Susquehanna river,</i> | 571.34 | |
| West Pittston Station, | 579.2 | 10 |
| Wyoming Station, | 588.03 | 12 |
| Maltby Station, | 558.19 | 14 |
| Bennett Station, | 553.07 | |
| Kingston, | 562.32 | 17 |
| Plymouth Junction with Penna. Coal Co.'s RR., (Frog,) (See Table 78,) | 542.64 | 19 |
| Plymouth, | 535 | 20 |
| Avondale, <i>opposite Center of Coal Office, main track,</i> | 530.33 | 22 |
| Nanticoke, | 538.09 | 24 |
| Hunlock's Creek, | 530.72 | 27 |
| Shickshiny, | 520.78 | 32 |
| Hick's Ferry, | 521.30 | 38 |
| Beach Haven, | 530.03 | 41 |
| Berwick, | 504.53 | 43.8 |
| Briar Creek, | 501.64 | 46.8 |
| Willow Grove, | 516.3 | |
| Lime Ridge, | 508.69 | 50.4 |
| Espy, | 490.25 | 53.8 |
| Bloomsburg, | 489.155 | 56 |
| Rupert, | 482.28 | 58 |
| Catawissa Bridge, | 472.565 | 60 |
| Danville, <i>N. E. end of depot, top of near rail,</i> | 457.45 | 68 |
| Chulasky, | 455.03 | 71 |
| Cameron, | 458.1 | 73 |
| Northumberland, <i>South-east line of Depot, .</i> | 452.35 | 80 |

The above Levels on the Bloomsburg Division of the Delaware and Lackawanna R.R. are from the notes of Mr. Chas. W. Ames, 2nd Geological Survey of Pennsylvania, June, 1877. The levels are based upon the elevation of the Comb of the Shamokin dam, 429.44 feet above mid tide at Havre de Grace. This datum was furnished by Mr. Thomas T. Wierman, jr. All elevations at R.R. stations in the above table are on top of near rail, opposite S. W. line of station-house, unless otherwise described.

To these are added levels, run from Bloomsburg north to the top of Knob Mountains, as follows :

| | |
|--|---------|
| Bench Mark on top of stone post S. E. corner of Maine and Market Streets, Bloomsburg, marked with a X , | 526.29 |
| Bench Mark on root of poplar tree in field of George Zigler, about 1½ miles from Bloomsburg, on road leading to Orangeville, marked with a X , and wrought-iron nail driven into the center of X , | 807.78 |
| Bench Mark on sandstone, marked with a X near gate, on south side of Peach Orchard, Crest of Knob Mountain, just above Orangeville, | 1302.53 |

TABLE 92b.

NORTH ALLEGHENY MOUNTAIN LEVELS.*In Sullivan and Luzerne Counties.*

| BENCH MARKS, STATIONS, &c. | Assumed Elevation. | Ocean Level. |
|---|-----------------------|-----------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Loyalsock Creek, at Turnpike Crossing, . | 1572 | 1650 |
| Junction of "Lee road" and Turnpike, . | 2205.77 | 2284 |
| On turnpike, in front of Hotel at Long Pond, Hill, east of Long Pond, | 2235 2305 | 2318 2383 |
| Junction of mud pond road and turnpike, . | 2180 | 2258 |
| Mud Pond road, at crossing of outlet of Long Pond, | 2114 | 2192 |
| Old Hammer Mill, on Sickler's Branch of Kitchen Creek, | 2107 | 2185 |
| Station, on ridge about 800 ft. east of Ham- mer Mill, | 2160.45 | 2238 |
| Top of ledge, above Bowman's Creek, . . . | 2080.24 | 2158 |
| Crossing of Branch of Bowman's Creek, . . | 1926.45 | 2004 |
| Forks of Bowman's Creek, | 1844.83 | 1923 |
| 200 feet below forks, Bench on hemlock on south bank of creek, about 2 ft. above the water, | 1827.48 | 1905 |
| Bench on Beach, in Philip's Creek Notch, . | 1841.76 | 1920 |
| Philips Creek, at crossing of main road foot of Mountain, | 1168.78 | 1247 |
| First run, east of Philip's Creek, | 1278.57 | 1357 |
| Arnold's Creek, | 1238.72 | 1317 |

| | | |
|--|---------|------|
| Head waters of Huntingdon Creek, | 1325.15 | 1403 |
| Huntingdon Creek, <i>at road crossing near Trumbower's</i> , | 1153.07 | 1231 |
| Forks of road, <i>near Bronson's</i> , | 1312.46 | 1390 |
| Crossing of Pike's Creek, <i>branch of Harvey's Creek</i> , | 1236.30 | 1314 |
| Opposite Raub's Mill, <i>on Harvey's Creek, (in road)</i> , | 1069.11 | 1147 |
| Water in Pond, <i>at Sturdevant's Mill, Harvey's Creek</i> , | 1017.48 | 1095 |
| Lane's Mill, <i>Harvey's Creek</i> , | 1001 | 1079 |
| Forks of road, | 916.93 | 995 |
| Mouth of Pike's Creek, | 874.92 | 953 |
| Falls on Harvey's Creek, <i>in the notch</i> , | 684.16 | 762 |
| Nanticoke, <i>top of rail main track L. & B. RR., (See Table 92)</i> , | 460.14 | 538 |

The above levels were run from Loyalsock Creek, across the plateau of North Mountain, to Nanticoke, on the North Branch of the Susquehanna river, by Mr. Mason of Laporte, Sullivan county, Pa., August, 1873, and furnished to the 2d Geological Survey of Penna. by Col. R. B. Ricketts, of Wilkesbarre.

NOTE.—Elevation of top of north rail, main track, L. & B. RR., opposite west line of Station house, at Nanticoke, according to level notes of Mr. Chas. W. Ames, June 27, 1877, is 538.09 above mean surface of Atlantic Ocean. $538.09 - 460.14 = 77.95$. Therefore 77.95 has been added to all the above elevations in the left hand column, to reduce the second column to Ocean level.

TABLE 93.

LACKAWANNA RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Carbondale. |
|---|--------------|--------------|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Carbondale, <i>Coal Brooke Breaker in Carbondale. The canal level at Carbondale is given by J. D. Steele as 965; (See Table 96)</i> , | 1083 | 1086 | 0 |
| Jermyn, | 968 | 971 | 7 |
| Archbald, | 965 | 968 | 8 |
| Olyphant, | 807 | 810 | 11 |
| Providence, <i>Elevation at the Lackawanna</i> , | 700 | 703 | 14 |

Elevations on the Lackawanna RR. between Carbondale and Scranton were furnished by Mr. A. H. Vandling, Superintendent Delaware and Hudson Canal Co.'s RR. at Providence, Luzerne County, Pa.

The datum is "Tide;" but whether high tide or mean tide is not known. Supposing it to be *mean* tide, 3.349 feet is added for Ocean level.

TABLE 94.
CARBONDALE AND HONESDALE RR.

| STATIONS. | | Above Carbondale. | Above Tide. | Ocean Level. |
|------------------------|--|----------------------|--------------|--------------|
| | | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Loaded cars, eastward. | Carbondale, lower end, . . | 00 | 1012 | 1015 |
| | Head of Plane 1, | 240 | 1252 | 1255 |
| | Head of Plane 2, | 377 | 1389 | 1292 |
| | Head of Plane 3, | 579 | 1591 | 1594 |
| | Head of Plane 4, | 762 | 1774 | 1777 |
| | Head of Plane 5, <i>Summit</i> , | 923 | 1935 | 1938 |
| | Head of Plane 6, | 906 | 1918 | 1921 |
| | Head of Plane 7, | 572 | 1584 | 1587 |
| | Foot of Plane 7. <i>From this point to Honesdale, a distance of 10 miles, there is a regular de- scent of 44 feet to the mile,</i> | 440 | 1452 | 1455 |
| Emp. cars back. | Honesdale, (<i>Table 95</i>), . | 00 | 1000 | 1003 |
| | Head of Plane 1, | 180 | 1180 | 1183 |
| | Head of Plane 2, | 178 | 1178 | 1181 |
| | Head of Plane 3, | 290 | 1290 | 1293 |
| | Head of Plane 4, | 424 | 1424 | 1427 |
| | Head of Plane 5, | 502 | 1502 | 1505 |

Levels on the Carbondale and Honesdale Railroad are in accordance with a profile furnished by Mr. A. H. Vandling, Superintendent of the Delaware and Hudson Canal Company, office of coal department, at Providence, Penna. According to the profile which is marked "Profile B, New Road," the *loaded* track starts from Carbondale at a point marked 1012 feet above tide; and the *empty* track starts at a point marked Honesdale 1000 feet above tide. In J. D. Steele's list, (table 96,) Carbondale and Honesdale are both alike called 965' above tide, at the level of the canal.

TABLE 95.

NEW YORK AND ERIE RR.—Honesdale Branch.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Honesdale. |
|--|--------------|--------------|--------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Honesdale, (<i>See Table 94,</i>) . | 966 | | 0 |
| White Mills, | 925 | | 4 |
| Hawley, (<i>See Table 78,</i>) | 899 | | 9 |
| Kimbles, | 849 | | 13 |
| Millville, | 780 | | 17 |
| Rowlands, | 700 | | 21 |
| Lackawaxen, | 650 | | 25 |

TABLE 96.

DELAWARE AND HUDSON CANAL.

| STATIONS. | Above Tide. | Ocean Level. | |
|--|--------------|--------------|--|
| | <i>Feet.</i> | | |
| Carbondale, (<i>See Table 93,</i>) . | 965 | | |
| Honesdale, | 965 | | |
| Hawley, | 880 | | |
| Port Jervis, | 455 | | |
| Port Clinton, | 455 | | |

This list is from J. Dutton Steele's profile of 1857, in Penna. Canal Co.'s office, at Harrisburg.

TABLE 97.

NEW YORK AND ERIE RR.—Jefferson Branch.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Lanesboro J. |
|--|--------------|--------------|----------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Lanesboro' Junction with the <i>Erie Railway at Lanesboro', in Susquehanna county, Pa., about 190 miles from New York City. This branch road runs south to the Anthracite Coal field. (See Table 98.)</i> . | | | 0 |
| Ninevah Junction, | 982 | | |
| Brandt's, | 981 | | |
| Stevens' Point, | 1047 | | |
| Webster's Mills, | 1078 | | |
| Starrucca, | 1297 | | |
| Thompson, | 1424 | | 8 |
| | 1703 | | 11 |

| | | | |
|---------------------------|------|-----------|----|
| Ararat Summit, | 2023 | | |
| Herrick Centre, | 1803 | | 22 |
| Uniondale, | 1693 | | 24 |
| Forrest City, | 1481 | | 30 |
| Carbondale, | 1079 | | 35 |

TABLE 98.

NEW YORK AND ERIE RR.*Eastern Division.*

| STATIONS. | Above Tide. | Ocean Level. | Dist. from New York. |
|--|--------------|--------------|-------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Jersey City, (opposite N. Y.,) | 5 | | 0 |
| West End, | 16 | | |
| Hackensack Junction, | 16 | | |
| Rutherford Park, | 48 | | 9 |
| Passaic Bridge, | 25 | | |
| Passaic, | 55 | | 11 |
| Clifton, | 56 | | |
| Lake View, | 93 | | |
| Patterson, | 77 | | 16 |
| Hawthorne, | 44 | | |
| Ridgewood, | 137 | | 21 |
| Hoboken, | 175 | | 23 |
| Allendale, | 263 | | 25 |
| Ramsey's, | 237 | | 27 |
| Mahwah, | 325 | | |
| Suffern's, | 298 | | 31 |
| Ramapo, | 299 | | 33 |
| Sloatsburg, | 334 | | 35 |
| Southfield, | 491 | | 41 |
| Greenwood, | 520 | | |
| Newburg Junction, | 518 | | 45 |
| Turner's, | 556 | | 47 |
| Munroe, | 606 | | 48 |
| Oxford, | 550 | | |
| Greycourt, | 435 | | 53 |
| Chester, | 459 | | |
| Goshen, | 430 | | 59 |
| Hampton, | 414 | | 63 |
| Middletown, | 559 | | 66 |
| Howell's, | 689 | | 70 |
| Otisville, | 836 ? | | 75 |
| Guyard's, | 784 | | |
| Port Jervis, on the Delaware river, | 440 | | 87 |

(N. Y. & E. RR.) *Delaware Division.*

| | <i>Feet.</i> | | <i>Miles.</i> |
|--|--------------|-----------|---------------|
| Port Jervis, | 440 | | 87 |
| Pond Eddy, | 571 | | 98 |
| Shoholo, | 648 | | 106 |
| Lackawaxen, (<i>See Table 95,</i>) . | 648 | | 115 |
| Pine Grove, | 668 | | 116 |
| Narrowsburg, | 714 | | 121 |
| Nobody's, | 748 | | 125 |
| Cohecton, | 748 | | 130 |
| Callicoon, | 781 | | 135 |
| Rock Run, | 787 | | 138 |
| Hawkins, | 809 | | 142 |
| Basket, | 830 | | 145.5 |
| Bouchou, | 850 | | 149 |
| Lordville, | 864 | | 152 |
| Stockport, | 896 | | 158 |
| Hancock, | 926 | | 163 |
| Dickinson's, | 954 | | 168 |
| Hale's Eddy, | 974 | | 171 |
| Deposit, | 1009 | | 176 |
| Summit, | 1373 | | 183 |
| Susquehanna, | 914 | | 191 |

Susquehanna Division.

| | | | |
|--|------|-----------|-----|
| Great Bend, | 884 | | 200 |
| Binghampton, (<i>Table 90,</i>) . . | 868 | | 214 |
| Hooper, | 839 | | 220 |
| Union, | 834 | | 222 |
| Campville, | 830 | | 229 |
| Owego, | 822 | | 236 |
| Tioga, | 805 | | 241 |
| Smithboro', | 799 | | 246 |
| Waverly, | 836 | | 255 |
| Chemung, | 820 | | 260 |
| Wellsboro', | 831 | | 266 |
| Elmira, | 863 | | 273 |
| Corning, (<i>Table 100,</i>) | 942 | | 290 |
| Painted Post, | 947 | | 292 |
| Erwin's, | 983 | | 295 |
| Addison, | 993 | | 301 |
| Rathboneville, | 1015 | | 306 |
| Cameron Mills, | 1029 | | 311 |
| Cameron, | 1056 | | 314 |
| Santees, | 1067 | | 316 |
| Adrian, | 1112 | | 322 |
| Canesteo, | 1134 | | 327 |
| Hornellsville, | 1161 | | 331 |

(N. Y. & E. RR.) *Western Division.*

| | <i>Fet.</i> | | <i>Miles.</i> |
|--|-------------|-----------|---------------|
| Almond, | 1400 | | 336 |
| Alfred, | 1650 | | 340 |
| Tip Top Summit, | 1783 | | 344 |
| Andover, | 1676 | | 348 |
| Genesee, | 1511 | | 357 |
| Scio, | 1458 | | 361 |
| Philipsville, | 1390 | | 365 |
| Belvidere, | 1384 | | 369 |
| Friendship, | 1539 | | 373 |
| Cuba Summit, | 1698 | | 377 |
| Cuba, | 1542 | | 382 |
| White House, | 1514 | | 385½ |
| Hindsdale, | 1501 | | 388.8 |
| Olean, | 1438 | | 393 |
| Allegheny, | 1422 | | 397.8 |
| Vandalia, | 1415 | | 402 |
| Carrollton, (<i>Table 103</i>), | 1399 | | 406.8 |
| Great Valley, | 1393 | | 410.2 |
| Salamanca, | 1384 | | 413 |
| Little Valley, | 1594 | | 420½ |
| Cattaraugus, | 1411 | | 427.8 |
| Persia, | 1390 | | 433.8 |
| Dayton, | 1346 | | |
| Perrysburg, | 1275 | | |
| Smith's Mills, | 1010 | | 447 |
| Forestville, | 883 | | 450.8 |
| Sheridan, | 775 | | |
| Dunkirk. <i>The elevation given at Dunkirk by Lake Shore and Michigan Southern R.R. is 24.94 + 573. L. Erie = 597.94, (See Table 194), . .</i> | 600 | | 459 |

Levels on the Erie Railway were copied from profiles furnished by Mr. H. D. Blunden, Assistant Engineer. The profiles are complete, embracing the main line of road from Jersey City to Dunkirk, and all branches owned by the Erie Railway Company.

The datum is tide water at Jersey City. This, if *mean tide*, may be considered equivalent to Ocean level.

TABLE 99.
NEW YORK AND ERIE RR.
Buffalo Division.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from New Y'rk. |
|----------------------------|----------------|--------------|-------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Hornellsville, | 1161 | | 331 |
| Arkport, | 1199 | | |
| Burns, | 1203 | | 338 |
| Caneseraga, | 1260 | | 342 |
| Garwood's, | 1280 | | |
| Swain's, | 1312 | | 347 |
| Turnout, | 1319 | | 350 |
| Nunda, | 1336 | | 354 |
| Hunt's, | 1339 | | 356 |
| Portage, | 1314 | | 360 |
| Castile, | 1401 | | 363 |
| Gainesville, | 1407 | | 366 |
| Warsaw, | 1326 | | 374 |
| Dale, | 1178 | | 379 |
| Linden, | 1181 | | 383 |
| Attica, | 998 | | 390 |
| Tonawanda Creek, | 1003 | | |
| Summit, | 1086 | | |
| Griswold, | 1044 | | |
| Darien, | 1024 | | |
| Alden, | 868 | | |
| Town Line, | 742 | | |
| Lancaster, | 683 | | 411 |
| Checktowga, | 661 | | |
| East Buffalo, | 611 | | 419 |
| Buffalo, | 588 | | 422 |

TABLE 100.
CORNING, COWANESQUE AND ANTRIM RR.

| STATIONS. | Tide. | Corrected Tide. | Dist. from Corning. |
|--|--------------|--------------------|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Corning, (<i>See Table 98,</i>) | *918 | †942 | 0 |
| Erwin Centre, | 952 | 976 | 9 |
| Lindley, | 973 | 997 | 13 |
| Lawrenceville, (<i>Table 101,</i>) | 982 | 1006 | 15 |
| Nelson, | 1162 | 1186 | 23 |
| Elkland, | 1118 | 1142 | 27 |
| <i>Lawrenceville, (Table 101,)</i> | <i>982</i> | <i>1006</i> | <i>0</i> |
| Tioga Village, | 1028 | 1052 | 7.3 |

| | | | |
|------------------------------|------|------|------|
| Holliday, | 1127 | 1151 | 14.5 |
| Middleburg, | 1154 | 1178 | 16.5 |
| Niles Valley, | 1168 | 1192 | 18 |
| Wellsboro', | 1295 | 1319 | 23.5 |
| Summit, | 1838 | 1862 | 29.5 |
| Antrim Coal Mines, | 1648 | 1672 | 35.5 |

* Grade at Corning Junction, according to Mr. Gorton.

† Grade at Corning Junction, by profile of Erie Railway.

The levels on Corning, Cowanesque and Antrim Railway were furnished by Mr. A. H. Gorton, Superintendent. The levels on this road have been reduced to the datum of the New York and Erie Railway, by adding 26 feet to Mr. Gorton's figures.

The datum is asserted to be that of the Erie R.R. at Corning; in other words, the above figures have been constructed on the basis of the Erie R.R. list, without reference to Mr. Gorton's intermediate station levels.

TABLE 101.
TIOGA RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Lawre'ce- ville. |
|--|----------------|-----------------|-----------------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Lawrenceville, (See Table 100,) . . | 1006 | | 0 |
| Somer's Lane, | 1018 | | 2.5 |
| Junction, with the extension of Tioga R.R. This extension is 19 miles in length, and forms a junction with Northern Central R.R. near Elmira, N. Y., (Table 102,) | 1021 | | |
| Mitchell's Creek, | 1022 | | 5 |
| Old Station, | 1035 | | 6 |
| Tioga, | 1042 | | 8 |
| Mill Creek, | 1077 | | 10 |
| Lamb's Creek, | 1111 | | 13 |
| Mansfield, | 1140 | | 16 |
| Canoe Camp Creek, | 1163 | | 18 |
| Covington, | 1208 | | 21 |
| Blossburg, | 1348 | | 26 |
| Morris Run, Coal Mines in the Blossburg Basin, | 1678 | | 30 |
| Arnot, Coal Mines in the Bloss- burg Basin, | 1682 | | 30 |
| Fall Brook, Coal Mines in the Blossburg Basin, | 1842 | | 32.5 |

Levels on the Tioga RR. were furnished by Mr. S. B. Elliott, Engineer of the T. RR.

TABLE 102.
TIOGA AND ELMIRA AND STATE LINE RR.

| STATIONS. | Above tide. | Distance. |
|---|--------------|------------------|
| | <i>Feet.</i> | <i>Miles.</i> |
| Tioga Junction with Tioga RR., near Somers' Lane, (See Table 101,) | 1021 | 0 |
| Summit, | 1593.5 | 6 |
| Trowbridge, | 1440.3 | 8 $\frac{1}{2}$ |
| Millerton, | 1246.3 | 11 $\frac{1}{4}$ |
| State Line, | 1092 | 13 $\frac{1}{4}$ |
| Seeley Creek, | 1041.3 | 14 $\frac{1}{2}$ |
| Wells, | 995.5 | 16 |
| State Line RR., Junction with North. Cent. RR., near Elmira, (See Table 132,) . . . | 908.5 | 19 |

ARNOT, PA., Dec. 19, 1876.

CHAS. ALLEN, Esq.

DEAR SIR: Your favor of the 15th is at hand. Since my last writing some changes in names of stations, on the extension of the Tioga R. Road and the Elmira and State Line R. Road, have been made. The corrected list is as follows: Tioga Junction, Summit, Trowbridge, Millerton, State Line, Seeley Creek, Wells, and State Line Junction. The changes are, 1st, Junction has been changed to Tioga Junction; 2d, Mud Lick Creek has been changed to Seeley Creek; 3d, N. C. RR. Junction has been changed to State Line Junction, and a new station, viz: State Line, has been added. This latter station is where the new road crosses the State line, and is 1092 ft. above tide, using same datum as for other stations given you in former letter. Please make the changes noted in your list for publication. When I sent them before, the road had not been opened, and nothing was really settled. The road is now in operation. The notes in pamphlet sent you first were on page 61. In list of stations on Tioga RR. add to the list Tioga Junction, and place it between "Somers' Lane" and "Mitchell's Creek." Put the elevation in as given you heretofore. Second, in page 77, in list of stations on Williamsport and Elmira RR., add to the list State Line Junction, and place it between stations "N. Y. State Line" and "Elmira." Thus both old roads will show their connection by the new one. I gave you, in former letter, the elevation above tide of the Junction of the new road with the Williamsport and Elmira RR., and now called "State Line Junction." This is not at the State line, but is so called because it is the junction of

the Williamsport and Elmira RR. with the Elmira and State Line RR. This, I believe, covers the ground of your inquiry. If anything more is desired which I can give, do not hesitate to ask.

Yours truly,

S. B. ELLIOTT,
Genl. Manager Blossburg Coal Company.

TABLE 103 (a.)
NEW YORK AND ERIE RR.—Bradford Branch.
Official Profile.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Carroll. Junction. |
|--|----------------|-----------------|-------------------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Carrollton Junction, <i>With the Erie RR., 407 miles from New York. This road runs south to the coal fields of McKean Co., Pa., (Table 98 Western Division.)</i> | 1400 | | 0 |
| Erwin's Mills, | 1409 | | |
| Limestone, | 1415 | | 6 |
| State Line, | 1419.6 | | |
| Babcock, | 1429 | | |
| Tarport, | 1437.8 | | |
| Bradford, | 1464 | | 11 |
| DeGolier, | 1510 | | 14 |
| Big Shanty, | 1715 | | 19 |
| Crawford's, | 2098 | | 22 |
| Summit, <i>Highest point on the profile, just south of Crawford's,</i> | 2140 | | |
| Alton, | 2080 | | 25 |
| Gilesville, | 2016 | | 26 |

Mr. D. Jones Lucas gives the elevation at Limestone Station, in the above table, 1411.4; Babcock, 1427.4; and Bradford Depot, 1449.3. Mr. Lucas says this result is from work in the field, obtained by him from the Erie RR. datum. This differs slightly from the figures on the profile, as shown above.

TABLE 103 (b).
NEW YORK AND ERIE RR.—Bradford Branch.
Finch's Profile.

| STATIONS. | Tide. | Ocean Level. |
|------------------------------------|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Carrollton, | 1381.20 | 1399 |
| Limestone, | 1393 | 1410 |
| Babcock, | 1401 | 1419 |
| State Line, | 1401.50 | 1419 |
| Tarport or Kendall, | 1420.66 | 1438 |
| Bradford, | 1426.84 | 1444 |
| DeGolier, | 1483.27 | 1501 |
| Lewis Run, | 1541.17 | 1559 |
| Big Shanty, | 1648.57 | 1666 |
| Crawford's, | 1941.05 | 1959 |
| Summit, | 2120.45 | 2138 |
| Alton, | 2069.55 | 2087 |
| Bond Vein, (Gilesville,) | 2037.16 | 2055 |
| Buttsville, | 1995.95 | 2014 |

Notes of the alignment and profile of the B. B. & P. RR. or Bradford branch of the Erie Railway were obtained from John M. Finch, General Land Agent at Hornellsville. The elevations in column 1 are those furnished by Mr. Finch, who asserted that they are in feet above ocean. I do not see how that can be, for the Erie Railway Junction, which is given in his notes as 1381.20, on the profile of the Erie Railway, (main line,) which I examined in Mr. Chanute's office, in New York, the elevation of the same point is given as 1398.827. This evidently shows that Mr. Finch's profile starts at the Junction 17.627 feet too low. In the second column this difference has been added to the elevations given in the first column. The levels of the proposed line of the Pa. and Erie Railway, from Wilcox to Buttsville, furnished by Chief Engineer Henry A. St. John, makes Buttsville 1976, based on the datum of the P. & E. RR., which has been shown is at least 16 feet too low. Making the necessary correction, this would establish Buttsville 1992 above ocean, or 22 feet below the elevation of the same point by Mr. Finch's profile, the accuracy of which I am disposed to question, from comparison with some of my own levels. I do not consider the levels of the Bradford Branch reliable south of Lewis Run Station.

Mr. Finch's profile is to be taken in preference to that already published.

Respectfully submitted,

CHAS. A. ASHBURNER.



V. NEW YORK CENTRAL RR. SYSTEM.

TABLE 104.
NEW YORK CENTRAL RR.

| NAMES OF STATIONS, &c. | Above Hudson River. | Above Ocean | Distance. |
|---|---------------------------|--------------|------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Water Surface Hudson River at Albany, | 00 | 7.46 | 0 |
| Grade of R.R. track, Albany depot, " " " West Albany depot, | 23.1 | 30.47 | |
| Grade of R.R. track, Centre depot, " " " at Summit depot, | 189.2 | 196.48 | |
| Grade of R.R. track, Centre depot, " " " at Summit depot, | 316.91 | 324.37 | |
| Grade of R.R. track, Schenectady depot, | 342.98 | 350.44 | |
| Water Surface Erie Canal, Schenectady, | 238.55 | 246.01 | 17 |
| Low Water Surface, Mohawk River, Schenectady, | 226.23 | 233.69 | |
| Grade of R.R. track, Hoffman's depot, | 206.20 | 213.66 | |
| Grade of R.R. track, Crane's village depot, | 258.24 | 265.70 | 26 |
| Grade of R.R. track, Crane's village depot, | 262.19 | 269.65 | |
| Grade of R.R. track, Amsterdam depot, | 271.28 | 278.74 | 33 |
| Grade of R.R. track, Tribes Hill depot, | 297.20 | 304.66 | 38 $\frac{1}{2}$ |
| Grade of R.R. track, Fonda depot, " " " Yost's depot, | 291.73 | 299.19 | 43 $\frac{1}{2}$ |
| " " " Yost's depot, " " " Spraker's depot, | 292.17 | 299.63 | 48 $\frac{3}{4}$ |
| Grade of R.R. track, Spraker's depot, | 293.79 | 301.25 | 52 |
| Grade of R.R. track, Palatine Bridge depot, | 296.49 | 303.95 | 55 |
| Grade of R.R. track, Fort Plain depot, | 303.49 | 310.95 | 58 |
| Grade of R.R. track, St. Johnsville depot, | 311.06 | 318.52 | 63 $\frac{3}{4}$ |
| Grade of R.R. track, East Creek depot, | 326.27 | 333.73 | |
| Grade of R.R. track, Little Falls depot, | 368.32 | 375.78 | 73 $\frac{1}{2}$ |

| | | | |
|--|--------|--------|-------------------|
| Grade of R.R. track, Herkimer depot, | 390.28 | 397.74 | 80 $\frac{3}{4}$ |
| Grade of R.R. track, Ilion depot, | 392.41 | 399.87 | 83 |
| “ “ “ Frankfort depot, | 394.62 | 402.08 | 85 $\frac{1}{4}$ |
| Water Surface Mohawk River, 3 miles East of Utica, | 385.87 | 393.33 | |
| Grade of R.R. track Utica depot, | 402.80 | 410.26 | 94 $\frac{3}{4}$ |
| “ “ “ Whitesboro depot, | 407.67 | 415.13 | 98 $\frac{1}{2}$ |
| Grade of R.R. track, Oriskany depot, | 415.73 | 423.19 | 101 $\frac{1}{2}$ |
| Water Surface Mohawk River, 4 miles east of Rome, | 410.95 | 418.41 | 105 |
| Water Surface Mohawk River at Rome, | 427.36 | 434.81 | |
| Erie Canal at Rome, | 424.96 | 432.42 | |
| Grade of R.R. track, Rome depot, | 437.74 | 445.20 | 109 |
| “ “ “ Green's Corners depot, | 458.15 | 465.61 | |
| Grade of R.R. track, Verona depot, | 459.78 | 467.24 | 117 $\frac{1}{2}$ |
| “ “ “ Oneida depot, | 432.22 | 439.68 | 121 $\frac{3}{4}$ |
| “ “ “ Canastota depot, | 429.46 | 436.92 | 127 |
| Grade of R.R. track, Canaseraga depot, | 410.95 | 418.41 | 130 $\frac{3}{4}$ |
| Grade of R.R. track, Chittenango depot, | 409.88 | 417.34 | 133 $\frac{1}{4}$ |
| Grade of R.R. track, Kirksville depot, | 415.76 | 423.22 | 137 |
| Grade of R.R. track, Manlius depot, | 409.00 | 416.46 | 139 $\frac{3}{4}$ |
| “ “ “ Dewitt “ | 409.93 | 417.39 | |
| “ “ “ Salina Street, Syracuse, | 395.26 | 402.72 | 147 $\frac{1}{2}$ |
| Low water, Onondago Lake, Syracuse, | 358.65 | 366.11 | |
| High Water, Onondago Lake, Syracuse, | 367.40 | 374.86 | |
| Grade of R.R. track, Warner's depot, | 419.31 | 426.77 | |
| Grade of R.R. track, Memphis depot, | 402.77 | 410.23 | 159 $\frac{3}{4}$ |
| Grade of R.R. track, Jordan depot, | 393.04 | 400.50 | 164 $\frac{3}{4}$ |
| “ “ “ Weedsport depot, | 396.79 | 404.25 | 169 |
| Grade of R.R. track, Port Byron depot, | 398.16 | 405.61 | 172 $\frac{1}{2}$ |
| Grade of R.R. track, Savannah | | | 179 $\frac{3}{4}$ |

| | | | |
|--|--------|--------|-------------------|
| Grade of R.R. track, Clyde depot, | 388.54 | 396.00 | 185 $\frac{3}{4}$ |
| “ “ “ Lyons “ | 399.62 | 307.08 | 192 $\frac{3}{4}$ |
| “ “ “ Newark “ | 410.61 | 418.07 | 198 $\frac{1}{4}$ |
| Grade of R.R. track, Palmyra depot, | 430.60 | 438.06 | 206 $\frac{1}{2}$ |
| “ “ “ Macedon “ | 463.30 | 470.76 | 210 $\frac{3}{4}$ |
| “ “ “ Fairport “ | 448.70 | 456.16 | 218 $\frac{1}{2}$ |
| “ “ “ State Street, Rochester, | 487.76 | 494.22 | 228 $\frac{1}{2}$ |
| Grade of R.R. track, Erie Canal Bridge, Rochester, | 517.86 | 525.32 | |
| Water Surface Erie Canal, Roches- ter, | 503.58 | 511.04 | |
| Grade of R.R. track, Churchville depot, | 563.02 | 570.48 | 243 |
| Grade of R.R. track, Bergen depot, | 601.72 | 609.18 | 246 |
| “ “ “ Byron “ | 687.50 | 694.96 | 253 |
| “ “ “ Batavia “ | 887.30 | 894.76 | 260 $\frac{1}{2}$ |
| “ “ “ Corfu “ | 855.50 | 862.96 | 272 $\frac{1}{4}$ |
| “ “ “ Crittenden de- pot, | 840.10 | 847.56 | 276 $\frac{3}{4}$ |
| Grade of R.R. track, Grimesville depot, | 695.60 | 703.06 | |
| Grade of R.R. track, East Buffalo Erie R.R. Crossing, | 608.40 | 615.86 | |
| Grade of R.R. track, Exchange St. depot, Buffalo, | 576.20 | 583.66 | 298 |
| Water Surface Lake Erie, April 28, 1874, | 567.04 | 574.50 | |
| Water Surface Lake Ontario, May 2, 1874, | 242.38 | 249.84 | |

*“Table of elevations on the New York Central and Hudson River R.R. referred to the water surface of the Hudson river at Albany. N. B. Mean low water at Albany, as determined by . . . Talcott, in 1868, is 2.62 lower than the datum of these elevations.” These elevations were furnished by Mr. Chas. H. Fisher, Chief Engineer N. Y. C. & H. R.R. Mean tide at Albany by the U. S. Coast Survey leveling is 4.84 feet above mean surface of Atlantic Ocean.

ALBANY, Dec. 31, 1877.

CHAS. ALLEN, Esq.

DEAR SIR: Referring to yours of the 27th, the addition to the heights in the list of levels that I sent you should be 7.46 to reduce them to the mean surface of the Ocean. Our levels start from a bench on the water table of the Delavan house in this city, with a recorded height of 20.15 + water surface of the Hudson River. This same bench has an elevation of 102.6 + Talcott's datum. His mean tide at Albany is 79.29, and the bench is, therefore, 22.77 above mean tide. The correction is, therefore,

$2.62 + 4.84 = 7.46$ to reduce to Ocean level. This correction makes the surface of Lake Erie 574.50, and of Lake Ontario 249.84. This difference from Mr. Gardner's elevation might easily have been caused by the condition of the lake at the time our levels were run to it, April 28, 1874. A strong westerly wind for two or three days has a great effect upon the surface of the lake at Buffalo. If our levels be connected with the lake at Cleveland *via* L. S. & M. S. R.R. profile, the elevation of the lake will differ but little from the height adopted by Gardner.

Thus N. Y. C. R.R. datum above Ocean level, 7.46
 Buffalo depot track by our levels, 576.20
 Cleveland depot track above Buffalo, 0.70

584.36

Cleveland depot track, City directrix, 8.50
 Cleveland City directrix above Lake Erie, 2.60 =

11.10

Lake Erie above Ocean, 573.26

This result certainly indicates that our difference in the elevation of the lake at Buffalo is due, in a great degree, to the condition of the lake at the time we connected with it.

Yours truly,

CHAS. H. FISHER,
Chief Engineer.

TABLE 105.
 (New York) SOUTHERN CENTRAL R.R.
 (A.) Knight's Record.

| NAMES OF STATIONS, &c. | N. Y. C. & H. R. R.R. Datum. | Ocean Level. | Distance. |
|---|------------------------------------|--------------|---------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Lake Ontario at Fairhaven, <i>water surface, July, 1871,</i> | 235 | 249.84 | 0 |
| Oswego Junction, <i>L. O. R.R. crossing,</i> | 309 | 316.46 | |
| Martville, | 360 | 367.46 | 5 |
| Cato, | 416 | 423.46 | 13 |
| Seneca River Crossing, <i>water surface,</i> | 377 | 384.46 | |
| Grade of N. Y. C. & H. R. R.R. at Weedsport crossing, (<i>Table 104,</i>) | 396.79 | 404.25 | |
| Grade of S. C. R.R. at Weedsport crossing, | 417.21 | 425.67 | |
| Erie Canal Crossing, <i>water surface,</i> | 399 | 406.46 | |
| Weedsport depot, | 422 | 429.46 | 21 |

| | | | |
|---|------|---------|---------|
| Crossing of Auburn Branch N. Y. C. & H. R. RR., (<i>Table —</i> ,) . . . | 644 | 651.46 | 31 |
| Wyckoffs, | 719 | 726.46 | 38 |
| Scipio, | 723 | 730.46 | |
| Cascade, | 717 | 724.46 | |
| Owasca Lake, <i>water surface</i> , . . . | 706 | 713.46 | |
| Moravia, | 725 | 732.46 | 48 |
| Locke, | 792 | 799.46 | 52 |
| Groton, | 990 | 997.46 | 58 |
| Freeville, <i>Utica, Ithaca & Elmira</i> <i>RR. Crossing, (Table —),</i> . . . | 1042 | 1049.46 | 63 |
| Dryden, | 1072 | 1079.46 | 66 |
| Dryden Lake, <i>water surface</i> , . . . | 1153 | 1160.46 | |
| Dryden Summit, | 1215 | 1232.46 | |
| Harford, | 1179 | 1186.46 | 72 |
| Richford, | 1090 | 1097.46 | 78 |
| Berkshire, | 1038 | 1045.46 | 82 |
| Newark Valley, | 959 | 966.46 | 88 |
| Flemingville, | 900 | 907.46 | |
| Owego, | 811 | 818.46 | 97 |
| Tioga, | 789 | 796.46 | 103 |
| Smithboro, | 787 | 794.46 | 107 |
| Barton, | 801 | 808.46 | |
| Ellis Creek, | 775 | 782.46 | 116 (?) |

Elevations of certain points on the Southern Central Railroad were furnished by Mr. Chas. H. Fisher, Chief Engineer N. Y. C. & H. R. RR., who received his information from Mr. F. E. Knight, late Chief Engineer of the S. C. RR. The datum is that of the N. Y. C. & H. R. RR., therefore $2.62 + 4.84 = 7.46$ has been added to each elevation (with the exception of first station, to which was added 14.84) to reduce to Ocean level. Mr. Fisher says: "There is certainly some error in the elevations north of Weedsport. Lake Ontario is 7.38 lower than by N. Y. C. levels, and Seneca river is $3\frac{1}{4}$ ft. higher, although the crossing on the S. C. RR. is below that on the N. Y. C. & H. R. RR." The next table shows some elevations on the same road from Mr. E. F. Swart, Chief Engineer.

TABLE 106.
(New York) SOUTHERN CENTRAL RR.
(B.) Swarts' Record.

| STATIONS. | Tide. | Corrected Tide. | Distance. |
|--|--------------|-----------------|-----------|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Fair Haven, (<i>Water Surface Lake Ontario,</i>) | 245 | 250 | |
| Cato, | 418 | 423 | |
| Weedsport, | 401 | 406 | |
| State Line, | 765 | 770 | |
| Smithboro', | 781 | 786 | |
| Owego, | 808 | 813 | |
| Newark Valley, | 948 | 953 | |
| Richford, | 1090 | 1095 | |
| Summit of Road (Dryden?) . . . | 1208 | 1213 | |
| Dryden, | 1079 | 1084 | |
| Groton, | 987 | 992 | |
| Moravia, | 721 | 726 | |
| Auburn, | 648 | 653 | |

AUBURN, November 27, 1876.

CHARLES ALLEN: The [above] are the elevations of stations on our road, as per request of Superintendent Knapp. The elevations are from Lake Ontario, *which is called 245 feet above sea level.*

Respectfully yours,

E. F. SWART,
Chief Engineer.

Assuming that Mr. Gardner's determination of the elevation of Lake Ontario (250 feet above Ocean) is correct, 5 feet has been added to each elevation, as given by Mr. Swart, for corrected tide or Ocean level. Mr. Charles H. Fisher, Chief Engineer N. Y. C. & H. R. RR., says: "I have been told, but don't know the truth of the statement, that the surface of Lake Ontario fluctuates considerably; that it attains its highest point every seven years!! The surface of Lake Erie, at Buffalo, is affected by prevailing winds."

Mr. Gardner's determination of elevation of Lake Ontario, 1873, . 249.99
Lake Erie, 1873, 573.08

Col. Comstock, in report of the Lake Survey, 1876, differs some from Mr. Gardner:

Lake Ontario, by Col. Comstock, 246.91
Lake Erie, do. do. 573.60

TABLE 107.
SYRACUSE, GENEVA AND CORNING RR.

| STATIONS. | N. Y. C. RR. Datum. | Ocean Level. |
|--|------------------------|--------------|
| | Feet. | Feet. |
| Geneva, intersection with Auburn branch of N. Y. C. RR., (Table —,) | 452 | 459.46 |
| Seneca Lake Water Surface, . . . | 440 | 447.46 |
| Dresden Station, | 508 | 515.46 |
| Grade of Northern Central RR. at crossing near Himrod's Station, | 805 | 812.46 |
| Grade of S. G. & C. RR. crossing, near Himrod's, | 823 | 830.46 |
| Dundee Station, | 983 | 990.46 |
| Watkins' Station, | 1013 | 1020.46 |
| Grade on bridge over Watkins' Glen, | 1021 | 1028.46 |
| Summit at Beaver Dams, | 1280 | 1287.46 |
| Beaver Dams Station, | 1272 | 1279.46 |
| Post Creek P. O., | 1180 | 1187.46 |
| Corning, Top of rail, Corning, Cowanesque & Antrim RR., (Ta- ble 100,) | 943 | 950.46 |

The above elevations on the Syracuse, Geneva and Corning RR. are furnished by Mr. Charles H. Fisher, Chief Engineer N. Y. C. & H. R. RR., and are referred to the datum of N. Y. C. & H. R. RR. Mr. Fisher was furnished with this information by Mr. A. Hardt, Chief Engineer. 7.46 has been added to each elevation as furnished by Mr. Fisher, to reduce to Ocean level.

TABLE 108.
ROCHESTER AND STATE LINE RR.

| STATIONS. | N. Y. C. & H. R. RR. Datum. | Ocean Level. |
|---|-----------------------------------|--------------|
| | <i>Fect.</i> | <i>Fect.</i> |
| Junction with <i>N. Y. C. RR.</i> , one mile west of Rochester, (<i>See Table —,</i>) | 523.7 | 531.16 |
| Scottsville, | 555.7 | 563.16 |
| Mumford, | 610.7 | 618.16 |
| Lime Rock, | 770 | 777.46 |
| Le Roy, | 863.7 | 871.16 |
| Pavillion, | 932.7 | 940.16 |
| Pearl Creek, | 950.7 | 958.16 |
| Wyoming, | 957.4 | 964.86 |
| Warsaw Station, 100' above Post Office, . . | 1109.7 | 1117.16 |
| Summit, between <i>E. Gainsville and Gainsville Creek</i> , | 1628.7 | 1636.16 |
| Gainsville Creek, surface of water in Wiscoy Creek, | 1602.7 | 1610.16 |
| Red School-house Summit, | 1687.7 | 1695.16 |
| Junction of town lines, <i>Pike, Eagle, and Gainsville</i> , | 1665.7 | 1673.16 |
| Howe's Summit, | 1804.7 | 1812.16 |
| Surface of Water, <i>S. Wiscoy Creek, Eagle P. O.</i> , | 1714.7 | 1722.16 |
| Summit, near and <i>S. W. of Eagle Village</i> , . | 1909 | 1916.46 |
| Summit, one-fourth mile south of <i>Fish lake</i> , . | 1769 | 1776.46 |
| Summit, one-half mile <i>S. W. of Elton P. O.</i> , . | 1696 | 1703.46 |
| Crossing of <i>B., N. Y. & Phila. RR.</i> , near <i>Ma-chias</i> , | 1639 | 1646.46 |
| Summit Swamp, head of <i>Great Valley Creek</i> , . | 1712 | 1719.46 |
| Ellicottsville, <i>Water Surface Great Valley Creek</i> , | 1541 | 1548.46 |
| Salamanca, <i>Erie RR. Junction</i> , (<i>Table 98,</i>) . | 1390 | 1397.46 |

Elevations on the Rochester and State Line Railroad were furnished by Mr. Charles H. Fisher, Chief Engineer N. Y. C. & H. R. RR., who received his information from Mr. C. S. Masten, late Chief Engineer. Datum, Hudson River, at Albany, or same as N. Y. C. & H. R. RR.; therefore, $2.62 + 4.84 = 7.46$ has been added to each elevation as furnished by Mr. Fisher, to reduce the same to Ocean level.

VI. SUSQUEHANNA RIVER SERIES.

TABLE 109.

NORTHERN CENTRAL RR.

(A.) From Old Profile.

| STATIONS. | Mean tide. | Ocean Level | Dist. from Bal'timore. |
|---|---------------|----------------|---------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Baltimore, | | | 0 |
| B. & P. R.R. Junction, | | | 1 |
| Mount Vernon, | 131 | | 2 |
| Green Spring Junction, with Green Spring Br. of N. C. R.R., (. . .) | | | 7 |
| Timonium, | 381 | | 12 |
| Cockeysville, | | | 15 |
| Sparks, | | | 19 $\frac{3}{4}$ |
| Monkton, | | | 23 |
| Parkton, | 420 | | 29 |
| Freelands, | 596 | | 34 $\frac{1}{2}$ |
| New Freedom, | 827 | | 37 |
| Seitzland, | 611 | | 41 |
| Glen Rock, | 551 | | 42 |
| Hanover Junction, with Hanover Branch, Han. & Gett. R.R., (. . .) | 422 | | 46 $\frac{1}{2}$ |
| Smyser's, | 389 | | 47 |
| Glatfelter's, | 335 | | 49 |
| Tunnel, | 299 | | |
| York, Junction with Peach Bottom R.R. and with York and Colum- bia R.R. and Fred. Div. Pa. R.R., (Tables 5, 119, 120,) | 366 | | 57 $\frac{1}{4}$ |
| Emigsville, | 376 | | 62 |
| Mount Wolf, | 376 | | 65 |
| Summit, No. 2, | 466 | | |
| Conewago Bridge, | 289 | | 67 |
| York Haven, | 291 | | |
| Goldsboro', | 304 | | 72 $\frac{1}{2}$ |
| Middletown Ferry, | 307 | | |
| Marsh Run, | 307 | | |
| New Cumberland, | 312 | | 81 |
| Bridgeport, Opposite Harrisburg. Junction with Cumberland Val- ley R.R., (Table 121,) | 355 | | 83 $\frac{1}{2}$ |

| | | | |
|--|-----|-----------|-------------------|
| Marysville, (<i>See Table 1,</i>) | 350 | | 91 |
| Dauphin, <i>Junction with Schuylkill and Susquehanna RR., (Tab. 50,)</i> | | | 92 $\frac{1}{2}$ |
| Clark's Ferry, | 361 | | 99 |
| Halifax, | 378 | | 105 $\frac{1}{2}$ |
| Millersburg, <i>Junction with Lykens Valley Coal RR. (Summit Branch RR.,) (Table 126,)</i> | 396 | | 111 $\frac{1}{4}$ |
| Liverpool, | | | 114 |
| Mahantonga, | | | 118 |
| Georgetown, | 417 | | 121 $\frac{1}{2}$ |
| Trevorton Junction, <i>with Mahanoy and Shamokin Branch P. & Reading RR., (Table 57,)</i> | 428 | | 126 $\frac{1}{2}$ |
| Fisher's Ferry, | 433 | | 131 |
| Selinsgrove Junction, | 438 | | 133 |
| Sunbury, <i>Junction 1. With Shamokin Branch RR. (Table 127.) 2. With Danville, Hazleton and Wilkesbarre RR. (Table 77.) 3. With Philadelphia & Erie RR. (Table 130.) Note.—The cars of the Northern Central run on the P. & E. RR. to Williamsport, and then on the leased line from Williamsport to Canandaigua, once called the Williamsport and Elmira RR., and now known as the northern extension of the Northern Central RR., (Tables 123, 129, 130,)</i> | 444 | | 138 |
| Mellvale,* | 168 | | |
| Timonium, | 395 | | |
| Ashland, | 269 | | |
| Monckton, | 344 | | |
| Parkton, | 430 | | |
| Summit, | 860 | | |
| Glenrock, | 556 | | |
| Glatfelter's, | 472 | | |
| York, | 373 | | |
| Conewago Creek, | 285 | | |
| Bridgeport, | 343 | | |
| Dauphin, | 332 | | |
| Halifax, | 360 | | |
| Lykens V. RR. Junction, | 380 | | |
| Millersburg, | 382 | | |
| Georgetown, | 417 | | |
| Sunbury, (<i>Tables 109, 110, 128, 129,</i>) | 429 | | |

Levels on the N. C. RR. were copied from an old lithographed profile in the office at Baltimore, Md.

Datum: Mean tide at Baltimore; equivalent to +Ocean level.

*A list of levels of some of the above named points, made by J. D. Steele, in 1857, was obtained in the office of the Penna. Canal Co., at Harrisburg, and is given for comparison.

TABLE 110.
NORTHERN CENTRAL RR.
(B.) Survey of Allen and Ames, 1877.

| NAMES OF STATIONS, &C. | Ocean Level. |
|--|------------------------|
| Harrisburg, <i>Urb stone at lamp post in front of U. S. Hotel,</i> | <i>Feet.</i> 320.54 |
| S. W. frog at grade crossing of N. C. RR. and C. V. RR., west end of C. V. RR. bridge, (See Tables 109, 121.) | 354.57 |
| Bridgeport Depot, top of west rail, | 354.57 |
| Top of south rail, opposite 90th mile post, | 351.45 |
| Marysville, Frog crossing of N. C. RR. and Pa. RR., near the RR. bridge crossing Susquehanna River from Marysville to Dauphin, (See Table 1.) | 350.37 |
| Marysville, top of south rail west end of RR. bridge, Marysville, bench mark on hard sandstone, perpendicular from south line of bridge, about 40 feet west from first pier, | 349.29 |
| Dauphin, top of south rail, east end of RR. bridge, | 311.68 |
| Dauphin, top of west rail, opposite center of passenger station, | 349.30 |
| Clark's Ferry, top of west rail, opposite south line of passenger station, | 349.66 |
| Powell's Creek, top of west rail, north end of RR. bridge crossing creek, | 366.25 |
| 104th mile-post, top of east rail, | 370.84 |
| Halifax, top of west rail, opposite north line of RR. Hotel, | 376.28 |
| Millersburg, top of west rail, crossing of Summit Branch RR., (See Table 124.) | 380.71 |
| Liverpool Station, top of west rail, 42 feet north from north line of passenger station, | 396.85 |
| Mahantonga, top of west rail, in center of public road crossing RR., | 396.11 |
| Georgetown, top of west rail, opposite center of telegraph office, | 404.84 |
| Trevorton Junction, (See Table 57,) Top of east rail, opposite south line of passenger station, | 416.2 |
| | 430.2 |

| | |
|---|--------|
| Fisher's Ferry, <i>top of west rail, opposite south line of station house,</i> | 438.87 |
| Selinsgrove Junction, (<i>See Table 7,</i>) <i>Frog at Junction,</i> | 438.85 |
| Selinsgrove Junction Station, <i>top of west rail, main track opposite S. line of station house,</i> | 438.5 |
| Sunbury, <i>top of frog at junction with Shamokin Branch of N. C. R.R., (See Table 127,)</i> | 441.94 |
| Sunbury, <i>top of west rail, main track, opposite north line of depot building, (See Table 130,)</i> | 444.15 |
| Sunbury, <i>top of frog at junction with D., W. and H. R.R., (See Table 77,)</i> | 450.9 |

The above elevations on the N. C. R.R. are copied from the level notes of Mr. Chas. W. Ames, 2d Geological Survey of Penna., May, 1877. Datum, Pa. R.R. elevation at Harrisburg.

*TABLE 111. .

TIDE WATER AND SUSQUEHANNA CANALS.

| NAMES OF LEVELS, &c. | Canal : Above mean mid-tide, Havre de Gr. | Low' water in River: Above mean mid-tide. Havre de Gr. | Towns. |
|--|--|--|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Tide-water Canal, Maryland: | | | |
| Surface of Havre de Grace level above Lock No. 10, | 5.45 | — | |
| Surface of Rock Run level above Lock No. 9, | 15.70 | Tide. | |
| Surface of Deer Creek dam above Lock No. 8, | 15.70 | 3.13 | { Mouth of Deer Creek. |
| Surface of Deer Creek level above Lock No. 7, | 27.05 | 8.50 | |
| Surface of Deer Creek level above Lock No. 6, | 36.30 | 16.48 | Shure's Lan'g |
| Surface of Deer Creek level above Lock No. 5, | 45.30 | 20.42 | |
| Surface of Deer Creek level above Lock No. 4, | 55.25 | 35.20 | |
| Surface of Conowingo level above Lock No. 3, | 65.10 | 37.03 | Conowingo. |
| Surface of Broad Creek level above Lock No. 2, | 72.80 | 49.04 | { Mouth Broad Creek. |
| Surface of State Line level, above Lock No. 1, | 81.20 | 54.93 | |
| | | 62.49 | |

| | | | |
|---|--------|---------|-------------------------------|
| Susquehanna Canal, Pennsylvania: | | | |
| Surface of level, above Lock No. 19, . . . | 90.90 | 68.95 | State Line. |
| Surface of Peach Bottom level above Lock No. 18, | 101.85 | 81.44 | Peach Bottom Wileyville. |
| Surface of Peach Bottom level above Lock No. 17, | 110.55 | *85.27 | |
| Surface of Muddy Creek dam above Lock No. 16, | 112.70 | 88.16 | |
| Surface of Muddy Creek level above Lock No. 15, | 121.50 | 97.35 | Mouth of Mud- dy Creek. |
| Surface of Lower Slab Tav- ern level above Lock No. 14, | 130.47 | 99.66 | |
| Surface of Slab Tavern level above Lock No. 13, . . . | 139.35 | 107.96 | Slab Tavern. |
| Surface of Slab Tavern level above Lock No. 12, . . . | 148.15 | 112.20 | |
| Surface of McCall's Ferry level above Lock No. 11, | 157.15 | 117.37 | McCall's Fer. |
| Surface of M'Call's Ferry level above Lock No. 10, | 165.00 | 128.85 | |
| Surface of Weigh Lock level above Lock No. 9, . . . | 172.25 | 129.42 | York Furnace Shenck's Fer. |
| Surface of Weigh Lock level above Lock No. 8, . . . | 180.70 | †141.70 | |
| Surface of Lock Port level above Lock No. 7, . . . | 188.30 | 152.79 | |
| Surface of Lock Port level above Lock No. 6, . . . | 196.97 | 163.16 | Lock Port. |
| Surface of Lock Port level above Lock No. 5, . . . | 204.48 | 173.62 | |
| Surface of Lock Port level above Lock No. 4, . . . | 212.94 | 177.78 | Bridgeville. |
| Surface of Lock Port level above Lock No. 3, . . . | 220.69 | 187.99 | |
| Surface of Five Mile level above Lock No. 2, . . . | 229.89 | 190.04 | Mouth of Fish- ing Creek. |
| Surface of Columbia dam above Lock No. 1, . . } | 230.69 | 207.31 | |
| | | ‡211.75 | Wrightsville. Columbia. |
| | | 214.59 | |

* Mouth of Stony Creek, Peach Bottom.

† Mouth of Otter Creek.

‡ Mouth of Cabin Branch Creek.

* Table showing the elevations of water surfaces on the Susquehanna and Tidewater Canal and the Susquehanna River, above mean mid-tide at Havre de Grace, Maryland, from surveys made in 1875, by Wm. H. Dechant, Assistant Engineer.

NOTE.—The datum of Susquehanna and Tide-water Canal levels is mean mid-tide at Havre de Grace, Md., furnished by Edwin Larkin, Esq., Resident Engineer, Susquehanna Bridge, P., W. and B. RR.

NOTE.—Comb of Columbia dam 230.69 above mid-tide at Havre de Grace, Md. Surface of Pennsylvania Canal basin, Columbia, =230.69+15.89=246.58 above mean mid-tide at Havre de Grace, Md. Penna. RR. main west-bound track in front of Passenger Depot, at a point in line with west side of Walnut street, as per level taken July 1876, 230.69+18.92=250.61 above mean mid-tide at Havre de Grace, Md.

EDWIN F. SMITH,
Chief Engineer Canals.

NOTE.—The levels to the low water in the river were all taken opposite the locks, as they are marked in table, except at the mouth of creeks, as seen in foot notes below table 111.

(See Mr. Edwin F. Smith's letter at foot of Table 58.)

TABLE 112.
PENNSYLVANIA CANAL.
Eastern Division.

| STATIONS. | Mean tide. | Ocean level. | |
|---|--------------|--------------|--|
| | <i>Feet.</i> | | |
| Columbia dam surface, . . . | 231.28 | | |
| Canal Basin (Columbia,) . . | 246.58 | | |
| Susquehanna River, below Con- ewago Falls, | 254.08 | | |
| Susquehanna River, above Con- ewago Falls, | 273.4 | | |
| Harrisburg Canal Basin, . . . | 322.4 | | |
| Surface of water in the large (Porter's) Basin at Harris- burg, | 322.4 | | |
| <i>Floor of vestibule of the State Capitol at Harrisburg,</i> . . | 368.17 | | |
| Clark's Ferry Dam, | 343.4 | | |

TABLE 113.
PENNSYLVANIA CANAL.
Juniata Division.


| STATIONS. | Mean tide. | Ocean level. | |
|--|--------------|--------------|--|
| | <i>Feet.</i> | | |
| Juniata River. Mouth: | | | |
| Mitre Sill of Stop Lock at Junction, (<i>See Table 114,</i> . | 357.4 | | |
| Millerstown dam, surface, . . | 388 | | |
| Lewistown dam, surface, . . . | 450.4 | | |
| Canal at Lewistown, surface, . | 460.1 | | |
| Aughwick dam, surface, . . . | 519.6 | | |
| Canal at Huntingdon, surface, | 613.6 | | |
| Huntingdon: | | | |
| Lower Mitre Sill of Lock No. 37, | 600.1 | | |

TABLE 114.
PENNSYLVANIA CANAL.
West Branch Division.

| STATIONS. | Mean tide. | Ocean level. | |
|--|------------|--------------|--|
| Juniata River, Mouth: | | | |
| Mitre Sill of Stop Lock at Junction, (<i>Table 113,</i>) | 357.3 | | |
| Liverpool, water in River, . . | 378.3 | | |
| Liverpool, water in Canal, . . | 390.4 | | |
| Water in river above Selinsgrove, | 421.5 | | |
| Water in Shamokin dam at Sunbury, | 429.4 | | |
| Water in Canal at Northumberland, (<i>Tables 115, 117, 118,</i>) | 442.4 | | |
| Water in Lewisburg dam, . . . | 434.5 | | |
| Water in Canal opposite Lewisburg, | 455.8 | | |
| Water in Muncy dam, | 469.0 | | |
| Water in Loyalsock dam and Canal, | 512.7 | | |
| Water in Canal at Williamsport, | 518.9 | | |
| Water in Lock Haven dam, . . | 550.4 | | |
| Water in Queen's Run dam, . . | 556.4 | | |
| Water in Bald Eagle dam, . . . | 556.91 | | |

TABLE 115.
PENNSYLVANIA CANAL.

Allen and Ames' Survey, 1877.

NOTE.—The term “above lower mitre sill,” in this table, signifies that the point referred to is on top of the coping or upper course of masonry in the lock wall, perpendicularly over or above the mitre sill. By the mitre sill, is meant the heavy pieces of oak timber, joined together in the bottom of the lock chamber thus  and securely fastened to the floor of the lock, and form the stop or support of the lock gates. All Bench Marks on stone, and marked thus X.

All these elevations on the Pennsylvania Canal, Bald Eagle Canal, and Beach Creek Canal are from the level notes of Mr. Charles W. Ames, Second Geological Survey of Pennsylvania, for month of May, 1877. The level line was started at Harrisburg, taking for the datum the elevation of the curb-stone at the lamp post, in front of the United States Hotel, corner of Market and Canal streets. This curb-stone has an elevation of 313.54 feet above high tide in the Schuylkill river, or 320.54 feet above the Atlantic ocean, and this information is from the notes of the Pa. RR. surveys, as furnished by Mr. W. H. Wilson, Consulting Engineer. The line was run along the towing path of the Penna. Canal to Clark's Ferry, where the level checked with Mr. Wierman's elevation of Clark's Ferry dam within .4, Mr. Ames' elevation of the dam being 343 feet and Mr. Wierman's 343.4. From this point (Clark's Ferry dam) Mr. Ames decided to adopt the elevation, as furnished by Mr. Wierman, (343.4,) for the datum of the levels on the Penna. Canal westward and on the Wiconisco Canal.

| NAMES OF TOWNS, NOS. OF LOCKS, &c. | Ocean Level. | Dist. from Harrisb'g. |
|---|--------------|-----------------------|
| | <i>Feet.</i> | <i>Miles.</i> |
| Harrisburg, Curb stone in front of U. S. Hotel according to Pa. RR. notes, . . . | 320.54 | |
| Harrisburg, Bench Mark on coping of west wall above lower mitre sill, Harrisburg lock, | 323.12 | |
| Harrisburg, lower mitre sill, | 303.05 | |
| Harrisburg, surface of water below lock, . . | 308.89 | |
| Harrisburg, surface of water above lock, . . | 322.39 | |
| Rockville Lock, lower mitre sill, | 316.72 | 5.1 |
| Do. surface of water below lock, | 322.42 | |
| Do. top of coping west wall over lower mitre sill, | 329.72 | |
| Rockville Lock, surface of water above lock, . . | 329.30 | |
| Do. Bench Mark on sandstone ledge in river bed, about 75 feet south from east end of Pa. RR. bridge at Rockville, . | 307.68 | |

| | | |
|---|--------|------|
| Dauphin Lock, <i>lower mitre sill</i> , | 323.54 | 7.7 |
| Do. <i>surface of water below lock</i> , | 329.71 | |
| Do. <i>top of Coping west wall over</i> <i>lower mitre sill</i> , | 337.74 | |
| Dauphin Lock, <i>surface of water above lock</i> , | 336.29 | |
| Twin Tavern Lock, <i>lower mitre sill</i> , | 332.09 | 12 |
| Do. <i>surface of water below</i> <i>lock</i> , | 336.92 | |
| Twin Tavern Lock, <i>top of Coping west wall</i> <i>above lower mitre sill</i> , | 346.69 | |
| Twin Tavern Lock, <i>surface of water above</i> <i>lock</i> , | 343.09 | |
| Guard Lock, (McKissicks,) <i>surface of water</i> <i>below lock</i> , | 343.09 | |
| Guard Lock, (McKissicks,) <i>lower mitre sill</i> , | 335.82 | |
| Do. <i>do. top of coping</i> <i>above lower mitre sill</i> , | 349.67 | |
| Surface of Water in Canal at Clark's Ferry, | 343.4 | |
| Guard Lock, Clark's Ferry, <i>lower mitre sill</i> , | 335.90 | 15 |
| Do. <i>do. top of Coping</i> <i>above lower mitre sill</i> , | 356.80 | |
| Outlet Lock, Clark's Ferry, <i>lower mitre sill</i> , | 335.77 | |
| Do. <i>do. top of Coping</i> <i>over lower mitre sill, north side</i> , | 357.5 | |
| Outlet Lock, Clark's Ferry, <i>surface of water</i> <i>above lock</i> , | 356.09 | |
| Raisner's Lock, <i>lower mitre sill</i> , | 349.36 | |
| Do. <i>surface of water above lock</i> , | 362.09 | |
| Juniata Junction Lock, <i>lower mitre sill</i> , | 357.03 | 17 |
| Do. <i>top of Coping above lower</i> <i>mitre sill</i> , | 371.59 | |
| Juniata Junction Lock, <i>surface of water</i> <i>above lock</i> , (<i>Table 125</i>), | 370.35 | |
| Surface of water in Juniata River, (<i>under</i> <i>Aqueduct</i>), | 342.6 | |
| Buffalo Lock, <i>lower mitre sill</i> , | 356.6 | 21.6 |
| Do. <i>surface of water below lock</i> , | 362.5 | |
| Do. <i>top of Coping above lower</i> <i>mitre sill</i> , | 371.47 | |
| Buffalo Lock, <i>surface of water above lock</i> , | 370.1 | |
| Montgomery Lock, <i>lower mitre sill</i> , | 378.63 | 24.7 |
| Do. <i>surface of water above</i> <i>lock</i> , | 377.75 | |
| Mount Patrick Lock, <i>lower mitre sill</i> , | 371.70 | 26.4 |
| Do. <i>top of Coping above</i> <i>lower mitre sill</i> , | 385.9 | |
| Mount Patrick Lock, <i>surface of water above</i> <i>lock</i> , | 384.57 | |

| | | |
|---|--------|------|
| Lower Liverpool Lock, <i>lower mitre sill</i> , . . . | 378 6 | 29 |
| Do. do. <i>top of Coping above lower mitre sill</i> , . . . | 393 | |
| Lower Liverpool Lock, <i>surface of water above lock</i> , . . . | 391.49 | |
| Upper Liverpool Lock, <i>lower mitre sill</i> , . . . | 386.35 | 30.8 |
| Do. do. <i>top of Coping west wall above lower mitre sill</i> , . . . | 399.25 | |
| Upper Liverpool Lock, <i>surface of water above lock</i> , . . . | 397.92 | |
| Surface of water in Susquehanna river at Liverpool ferry, . . . | 379.3 | |
| Dry Saw-Mill Lock, <i>lower mitre sill</i> , . . . | 391.70 | 33.8 |
| Do. do. <i>top of Coping east wall above lower mitre sill</i> , . . . | 405.10 | |
| Dry Saw-Mill Lock, <i>surface of water above lock</i> , . . . | 403.32 | |
| Mahantonga Lock, <i>lower mitre sill</i> , . . . | 396.61 | 35.6 |
| Do. <i>top of Coping west wall above lower mitre sill</i> , . . . | 412.36 | |
| Mahantonga Lock, <i>surface of water above lock</i> , . . . | 410.97 | |
| Hetzell's Lock, <i>lower mitre sill</i> , . . . | 405.09 | 40 |
| Do. <i>top of Coping west wall above lower mitre surface</i> , . . . | 418.23 | |
| Hetzell's Lock, <i>surface of water above lock</i> , . . . | 417.55 | |
| Port Treverton Lock, <i>lower mitre sill</i> , . . . | 411.6 | 42 |
| Do. do. <i>top of Coping west wall above lower mitre sill</i> , . . . | 426.11 | |
| Port Treverton Lock, <i>surface of water above lock</i> , . . . | 425.18 | |
| Bench Mark, <i>on second Course of Masonry S. E. corner first pier, west end RR. bridge, Port Treverton</i> , . . . | 404.15 | |
| Guard Gate, 2 miles below Sunbury, <i>miter sill</i> , . . . | 420.48 | |
| Guard Gate, 2 miles below Sunbury, <i>Top of Coping above mitre sill</i> , . . . | 436.93 | |
| Sunbury Lock, <i>surface of water below lock</i> , . . . | 427.58 | 52.7 |
| Do. <i>top of Coping above lower mitre sill</i> , . . . | 435.6 | |
| Surface of water above Sunbury Lock and in Shamokin dam, . . . | 429.44 | |
| Outlet Lock, Northumberland, <i>lower mitre sill</i> , . . . | 422.22 | 55.3 |
| Outlet Lock, Northumberland, <i>Bench Mark on Coping above lower mitre sill, west wall</i> , . . . | 443.56 | |
| High Water Mark, <i>flood of 1865, on coping of wing wall of Canal bridge, east side, Northumberland</i> , . . . | 447.8 | |

| | | |
|---|--------|------|
| Lock No. 13, Northumberland, <i>lower mitre sill</i> , | 438.26 | 55.9 |
| Lock No. 13, Northumberland, <i>top of Coping west wall above lower mitre sill</i> , | 451.21 | |
| Lock No. 13, Northumberland, <i>surface of water above lock</i> , | 449.74 | |
| Lock No. 14, one mile below Montandon, <i>lower mitre sill</i> , | 444.91 | 61.8 |
| Lock No. 14, one mile below Montandon, <i>Top of Coping above lower mitre sill</i> , | 456.81 | |
| Lock No. 14, one mile below Montandon, <i>surface of water above lock</i> , | 455.68 | |
| Lock No. 15, <i>the upper lock in the Cross-cut Canal from Lewisburg dam, lower mitre sill</i> , | 445.76 | |
| Lock No. 15, <i>top of coping west wall above lower mitre sill</i> , | 457.21 | |
| Lock No. 16, <i>near the Lewisburg dam, lower mitre sill</i> , | 430.13 | |
| Lock No. 16, <i>top of coping, above lower mitre sill</i> , | 444.13 | |
| Lock No. 16, <i>surface of water above lock</i> , | 449.62 | |
| Lock No. 17, at Milton, <i>lower mitre sill</i> , | 450.74 | 65.5 |
| Do. <i>top of coping south wall, above lower mitre sill</i> , | 462.68 | |
| Lock No. 17, <i>surface of water above lock</i> , | 461.8 | |
| Surface of water in Susquehanna river, <i>under Catawissa R.R. bridge at Milton</i> , | 435.7 | |
| Bench Mark, <i>on shale ledge, 50 feet west from south end of Catawissa R.R. bridge, Milton</i> , | 443.43 | |
| Lock No. 18, Watsontown, <i>lower mitre sill</i> , | 456.23 | 69.9 |
| Do. <i>top of coping south wall, above lower mitre sill</i> , | 468.43 | |
| Lock No. 18, <i>surface of water above lock</i> , | 467 | |
| Lock No. 19, Montgomery, <i>lower mitre sill</i> , | 462.18 | 77.3 |
| Do. <i>top of coping south wall, above lower mitre sill</i> , | 474.88 | |
| Surface of water in Muncy Dam, | 469 | 78.5 |
| Lock No. 21, <i>lower mitre sill</i> , | 463.8 | |
| Do. <i>top of coping above lower mitre sill</i> , | 479 | |
| Lock No. 21, <i>surface of water above lock</i> , | 484.42 | |
| Lock No. 22, at Muncy, <i>lower mitre sill</i> , | 479.44 | 81.5 |
| Do. <i>top of coping south wall, above lower mitre sill</i> , | 490.74 | |
| Lock No. 22, <i>surface of water above lock</i> , | 489.93 | |
| Lock No. 23, near Hall's Station, on the Catawissa R.R., <i>lower mitre sill</i> , | 485.19 | 84.2 |

| | | |
|--|--------|------|
| Lock No. 23, <i>top of coping south wall, above lower mitre sill,</i> | 497.19 | |
| Lock No. 23, <i>surface of water above lock,</i> | 496.43 | |
| Lock No. 24, <i>near lock No. 23, lower mitre sill,</i> | 491.14 | 84.3 |
| Lock No. 24, <i>top of coping south wall, above lower mitre sill,</i> | 503.4 | |
| Lock No. 24, <i>surface of water above lock,</i> | 501.5 | |
| Lock No. 25, <i>two miles below Montoursville, lower mitre sill,</i> | 496.94 | 88.5 |
| Lock No. 25, <i>top of coping south wall, above lower mitre sill,</i> | 509.29 | |
| Lock No. 25, <i>surface of water above lock,</i> | 507.62 | |
| Lock No. 26, <i>just below Loyal Sock dam, lower mitre sill,</i> | 503.32 | 90.7 |
| Lock No. 26, <i>top of coping south wall, above lower mitre sill,</i> | 515.17 | |
| Lock No. 26, <i>surface of water above lock,</i> | 512.45 | |
| Lock No. 27, <i>just above Montoursville, lower mitre sill,</i> | 507.98 | 91.5 |
| Lock No. 27, <i>top of coping south wall, above lower mitre sill,</i> | 521.13 | |
| Lock No. 27, <i>surface of water above lock,</i> | 518.75 | |
| Surface of water in canal at Williamsport, | 518.9 | |
| Surface of water in Susquehanna river, <i>under P. & E. R.R. bridge at Williamsport,</i> | 498.1 | |
| Outlet lock at Williamsport, <i>lower mitre sill,</i> | 501.67 | |
| Do. <i>top of coping west wall, above lower mitre sill,</i> | 519.87 | |
| Surface of water in Williamsport dam, | 507.87 | |
| Lock No. 28, <i>Upper Williamsport, lower mitre sill,</i> | 515.15 | |
| Bench Mark on <i>top of coping south wall, above lower mitre sill, (Lock No. 28,)</i> | 524.65 | |
| Lock No. 28, <i>surface of water above lock,</i> | 523.34 | |
| Lock No. 29, <i>about 6 miles east from Jersey Shore, lower mitre sill,</i> | 518.27 | |
| Lock No. 29, <i>top of coping ab. lower mitre sill,</i> | 529.22 | |
| Lock No. 29, <i>surface of water above lock,</i> | 527.73 | |
| Lock No. 30, <i>about 5 miles east from Jersey Shore, lower mitre sill,</i> | 523.28 | |
| Lock No. 30, <i>top of coping south wall, above lower mitre sill,</i> | 536.28 | |
| Lock No. 30, <i>surface of water above lock,</i> | 534.96 | |
| Lock No. 31, <i>Larry's Creek, lower mitre sill,</i> | 530.39 | |
| Do. <i>top of coping south wall, above lower mitre sill,</i> | 543.24 | |
| Lock No. 31, <i>surface of water above lock,</i> | 541.80 | |
| Lock No. 32, <i>Jersey Shore, lower mitre sill,</i> | 536.84 | |

| | |
|--|--------|
| Bench Mark on top of coping south wall, above lower mitre sill, (Lock No. 32,) . . . | 548.24 |
| Lock No. 32, surface of water above lock, . . | 546.81 |
| Surface of water in Susquehanna river at Jersey Shore, | 508 |
| Lock No. 33, <i>Liberty</i> , lower mitre sill, . . . | 543.45 |
| Bench Mark on top of coping south wall, at upper gate, (Lock No. 33,) | 558.28 |
| Lock No. 35, surface of water above lock, . . | 549.29 |
| Lock No. 34, <i>Lockport</i> , opposite Lock Haven, lower mitre sill, | 543.25 |
| Lock No. 34, top of coping south wall, above lower mitre sill, | 561.55 |
| Surface of water in Lock Haven dam, | 550.4 |
| Lock No. 37, (?) at <i>Queen's Run</i> dam, lower mitre sill, | 544.53 |
| Lock No. 37, top of coping west wall, above lower mitre sill, | 561.83 |
| Lock No. 35, (?) <i>Bald Eagle</i> Cross-cut Canal at Lock Haven, lower mitre sill, | 543.69 |
| Lock No. 35, top of coping west wall, above lower mitre sill, | 557.59 |
| Bench Mark on top of (limestone) coping west wall, at lower gate (Lock No. 35?), Lock Haven, | 557.59 |
| Lock No. 36, (?) <i>Bald Eagle</i> inlet, lower mitre sill, | 551 |
| Lock No. 36, top of coping west wall, above lower mitre sill, | 559.6 |
| Surface of water in <i>Bald Eagle</i> dam, | 556.91 |
| Lock No. 1, <i>Beach Creek</i> Canal, two miles above <i>Bald Eagle</i> dam, lower mitre sill, . . | 551.05 |
| Lock No. 1, top of coping west wall, | 562.65 |
| Lock No. 1, surface of water above lock, . . | 560.46 |
| Lock No. 2, 1500 feet from Lock No. 1, lower mitre sill, | 557.11 |
| Lock No. 2, top of coping east wall, above lower mitre sill, | 568.21 |
| Lock No. 2, surface of water above lock, . . | 565.87 |
| Lock No. 3, (McDonald's,) two miles from Lock No. 2, lower mitre sill, | 563.1 |
| Lock No. 3, top of coping west wall, above lower mitre sill, | 577.8 |
| Lock No. 3, surface of water above lock, . . | 576.74 |
| Lock No. 4, four miles from Lock No. 3, lower mitre sill, | 572.45 |
| Lock No. 4, top of east wall, above lower mitre sill, | 580.85 |
| Surface of water in <i>Beach Creek</i> dam, . . . | 576.5 |

TABLE 116.
WICONISCO CANAL.
Allen and Ames' Survey, 1877.

| NAMES OF TOWNS, NOS. OF LOCKS, &c. | Ocean Level. |
|---|--------------|
| | <i>Feet.</i> |
| Lock No. 1, Clark's Ferry, <i>lower mitre sill</i> , | 335 .85 |
| Do. do. <i>Top of Coping east wall</i> | |
| above <i>lower mitre sill</i> , | 353 .85 |
| Lock No. 1, Clark's Ferry, <i>surface of water above lock</i> , | 345 .25 |
| Lock No. 2, <i>lower mitre sill</i> , | 341 .67 |
| Do. <i>Top of Coping west wall above lower mi-</i> | |
| tre <i>sill</i> , | 353 .6 |
| Lock No. 2, <i>surface of water above lock</i> , | 353 .4 |
| Lock No. 3, <i>lower mitre sill</i> , | 347 .47 |
| Do. <i>Top of Coping west wall above lower mi-</i> | |
| tre <i>sill</i> , | 360 .14 |
| Lock No. 3, <i>surface of water above lock</i> , | 359 .39 |
| Lock No. 4, <i>lower mitre sill</i> , | 353 .78 |
| Do. <i>Top of coping above lower mitre sill</i> , . . | 366 .78 |
| Do. <i>Surface of water above lock</i> , | 365 .18 |
| Lock No. 5, <i>lower mitre sill</i> , | 359 .93 |
| Do. <i>Top of Coping west wall above lower mi-</i> | |
| tre <i>sill</i> , | 371 .73 |
| Lock No. 5, <i>surface of water above lock</i> , | 370 .21 |
| Lock No. 6, Halifax, <i>lower mitre sill</i> , | 365 .26 |
| Do. do. <i>Top of Coping west wall above</i> | |
| lower <i>mitre sill</i> , | 376 .36 |
| Lock No. 6, Halifax, <i>surface of water above lock</i> , . . | 375 .59 |
| Lock No. 7, Millersburg, <i>lower mitre sill</i> , | 370 .81 |
| Do. do. <i>Top of Coping east wall</i> | |
| above <i>lower mitre sill</i> , | 386 .41 |

The elevations on the Wiconisco Canal, from Clark's Ferry to Millersburg, (thirteen miles, which is the entire length of the canal,) are copied from the notes of Mr. Chas. W. Ames, 2d Geological Survey of Pa., May, 1877. Datum, elevation of Comb of Clark's Ferry dam, 343.4, (above mid tide or Ocean level,) as furnished by Mr. Thomas T. Wierman, Jr. See table 115.

TABLE 117.
PENNSYLVANIA CANAL.
Wyoming Division.

| STATIONS. | Mean tide. | Ocean level. | |
|---|--------------|--------------|--|
| | <i>Feet.</i> | | |
| Northumberland; canal level, (<i>Table 114</i>), | 442.3 | | |
| Bench Mark at Northumberl'd, | 444.5 | | |
| Danville; canal level, | 453.6 | | |
| Bloomsburg; canal level, | 480.3 | | |
| Below Berwick; canal level, | 490.6 | | |
| Shickshinny; canal level, | 510.7 | | |
| Nanticoke dam, | 514.6 | | |
| Wilkesbarre; canal level, | 543.8 | | |
| Water in river ab'e Wilkesbarre, | 521.3 | | |
| Top of coping Plainsville Lock, | 551.3 | | |

Elevations on the Pennsylvania Canal. Tables 112, 113, 114, 117, were furnished by Mr. Thos. T. Wierman, jr.

Datum is *mean tide*, Chesapeake Bay, at Havre de Grace, according to levels of Susquehanna Canal. (*See Table 111.*)

TABLE 118.
PENNSYLVANIA CANAL.
Wyoming Division.

| NAMES OF TOWNS, NUMBERS OF LOCKS, &c. | Ocean Level. | Dist. from Northumb'd. |
|--|--------------|------------------------|
| | <i>Feet.</i> | <i>Miles.</i> |
| Sunbury, <i>Comb of Shamokin dam</i> , | 429.44 | |
| Northumberland, <i>Bench Mark on Coping of lock wall above lower mitre sill, west wall, outlet lock marked thus, X</i> , | 443.55 | |
| Northumberland, <i>surface of water in Shamokin dam</i> , | 429.55 | |
| Northumberland, <i>surface of water in canal</i> , | 441.99 | |
| Lock No. 1, <i>one mile above Northumberland, lower mitre sill</i> , | 437.31 | 1.2 |
| Lock No. 1, <i>surface of water below lock</i> , | 442.81 | |
| Lock No. 1, <i>top of Coping, north wall, above lower mitre sill</i> , | 455.9 | |
| Lock No. 1, <i>surface of water above lock</i> , | 454.3 | |
| Lock No. 2, <i>two miles above Danville, lower mitre sill</i> , | 449.59 | |
| Lock No. 2, <i>top of Coping, north wall, above lower mitre sill</i> , | 467.49 | |
| Lock No. 2, <i>surface of water above lock</i> , | 465.51 | |
| Surface of water in Canal at Catawissa, | 465.79 | |

| | | |
|---|---------|-------|
| Lock No. 3, Ruperts, <i>lower mitre sill</i> , . . . | 460 .37 | 21 .7 |
| Do. do. <i>top of Coping, west wall, above lower mitre sill</i> , | 477 .57 | |
| Lock No. 3, <i>surface of water above lock</i> , . | 476 .16 | |
| Lock No. 4, Bloomsburg, <i>lower mitre sill</i> , . | 470 .38 | 23 .1 |
| Do. do. <i>top of Coping, west wall, above lower mitre sill</i> , | 482 .88 | |
| Lock No. 4, <i>surface of water above lock</i> , . | 481 .69 | |
| Lock No. 5, Stonetown, <i>lower mitre sill</i> , . | 476 .27 | 30 |
| Do. do. <i>top of coping, north wall, above lower mitre sill</i> , | 493 .37 | |
| Lock No. 5, <i>surface of water above lock</i> , . | 491 .32 | |
| Lock No. 6, Berwick, <i>lower mitre sill</i> , . . | 485 .55 | 36 .2 |
| Do. do. <i>top of Coping, north wall, above lower mitre sill</i> , | 501 .65 | |
| Lock No. 6, <i>surface of water above lock</i> , . | 499 .8 | |
| Lock No. 7, Beach Haven, <i>lower mitre sill</i> , . | 484 .22 | 39 .3 |
| Do. do. <i>top of Coping, north wall, above lower mitre sill</i> , | 511 .30 | |
| Lock No. 7, <i>surface of water above lock</i> , . | 508 .72 | |
| Surface of water in Canal at Shickshinny, . | 510 .52 | |
| Lock No. 8, Nanticoke, <i>lower mitre sill</i> , . | 504 .98 | 55 .8 |
| " " <i>top of Coping, north wall, above lower mitre sill</i> , | 524 .98 | |
| Lock No. 8, <i>surface of water below lock</i> , . | 512 .83 | |
| Surface of water in Nanticoke dam, | 514 .76 | |
| Do. do. do. (Wierman,) | 514 .6 | |
| Lock No. 9, opposite Plymouth, <i>lower mitre sill</i> , | 506 .73 | 59 .9 |
| Lock No. 9, <i>top of Coping, south wall, above lower mitre sill</i> , | 525 .00 | |
| Lock No. 10, two (2) miles below Wilkesbarre, <i>lower mitre sill</i> , | 518 .28 | 62 .6 |
| Lock No. 10, <i>surface of water below lock</i> , . | 523 .73 | |
| Lock No. 10, <i>top of Coping, (timber,) north wall, above lower mitre sill</i> , | 535 .88 | |
| Lock No. 11, Wilkesbarre, <i>lower mitre sill</i> , . | 528 .73 | 63 .5 |
| Do. do. <i>surface of water below lock</i> , | 534 .09 | |
| Lock No. 11, <i>top of Coping, south wall, above lower mitre sill</i> , | 544 .43 | |
| Lock No. 11, <i>surface of water above lock at Wilkesbarre</i> , | 543 .33 | |
| Lock No. 12, Plainsville, <i>lower mitre sill</i> , . | 538 .62 | |
| Do. do. <i>top of Coping</i> , . | 550 .3 | |
| Do. do. <i>surface of water above lock</i> , | 547 .75 | |

NOTE.—From Plainsville northward the Canal has not been used for navigation since 1865.

| | |
|--|--------|
| Lock No. 13, Port Blanchard, lower mitre sill, | 544.5 |
| Lock No. 13, top of north wall above lower mitre sill, | 556.8 |
| Lock No. 13, surface of water above lock, | 552 |
| Surface of water in Canal at Lackawanna Junction, | 557.69 |

The elevations on the Wyoming Division of the Pennsylvania Canal are copied from the level notes of Mr. Chas. W. Ames, 2d Geological Survey of Penna., June, 1877. The datum point is the elevation as given by Mr. Thos. T. Wierman, jr., of the Comb of the Shamokin dam at Sunbury, 429.44 feet above mid tide in Chesapeake Bay, or Ocean level.

TABLE 119.
PEACH BOTTOM RR.

| STATIONS. | Mean tide. | | |
|--|--------------|--|--|
| | <i>Feet.</i> | | |
| Susquehanna River, surface of water, | (85.88) | | |
| Peach Bottom, grade, | 118.37 | | |
| Bangor Summit, B. M., | 511.23 | | |
| Delta, B. M., | 435.37 | | |
| Bryansville, B. M., | 241.36 | | |
| Woodbine, B. M., | 294.21 | | |
| Bridgeton, B. M., | 304.89 | | |
| Bruce, B. M., | 331.50 | | |
| Muddy Creek Forks, B. M., | 366.86 | | |
| High Rock, B. M., | 382.93 | | |
| Laurel, grade, | 411.62 | | |
| Fenmore, grade, | 434.64 | | |
| Brogueville, B. M., | 478.19 | | |
| Felton, grade, | 536.46 | | |
| Windsor, grade, | 598.8 | | |
| Springvale, grade, | 734.4 | | |
| Red Lion, grade, | 900.5 | | |
| Dallastown, grade, | 657.00 | | |
| Ore Valley, B. M., | 570.32 | | |
| Enterprise, grade, | 531.20 | | |
| Small's Mills, grade, | 433.75 | | |
| Springgarden, B. M., | 431.53 | | |
| York, (Tables 109, 5, 120,) | 381.24 | | |

Levels of the Peach Bottom R.R. were copied from notes in the office at York.

Datum: Susquehanna River at Peach Bottom, on the assumption that the water in the river at Peach Bottom stood at 85.88 feet above tide; and this elevation corresponds with the Susquehanna Canal levels. In the recent leveling of the Susquehanna Canal, low water in the Susquehanna River at Peach Bottom is found to be 85.27 above mid tide at Havre de Grace. See *Table 111*.

This R.R. is a 3-foot or "Narrow Gauge," and connects with the Northern Central R.R. at York.

Since the former report of levels of Pennsylvania was published, the profile of the Peach Bottom R.R. has been carefully reexamined, and after consulting the report of Mr. Edwin F. Smith, Chief Engineer, Susquehanna Canal, and Mr. J. B. Hutchinson, Chief Engineer C. and P. D. R.R., Mr. Beaton Smith, C. E., York, Pa., and the letter from Mr. J. E. Mathews, Assistant Engineer, Western Maryland R.R., (following *Table 144*), I am of the opinion that the elevations heretofore published in the first column, on page 66, under the head of "Assumed Datum," should read "Mean Tide." The junction of the Peach Bottom R.R. with the Northern Central R.R. is about 1,000 feet north from the south line of the passenger station on the N. C. R.R. at York. There is a descent of 5 feet from this junction point to the south line of the above station, and by carrying the levels of the P. B. R.R. to this point, the elevation is 376 feet above mid tide in Chesapeake Bay. According to *Table 5*, corrected by Mr. W. H. Wilson, Consulting Engineer, Pa. R.R., the elevation at York is 379. This is from an old profile, and, I have no doubt, was correct when made; but it is very likely that the track has been lowered since the profile was made, or the point called "York" on the profile may not have been at the south line of the passenger station, and as it is shown above that we found in leveling a descent of 5 feet, in a distance of 1,000 feet, the difference of 3 feet between the elevation in *Table 5* and the elevation of the Peach Bottom R.R. (continued to N. C. R.R. depot) could easily occur. The N. C. R.R., *Table 109*, (according to profile,) gives the elevation at York 366, and the profile of Frederick Division, Pa. R.R., *Table 120*, starts at York, 364.6. There is no doubt but points could be found in York which would agree with all the elevations given by each authority; but as I am in the dark as to the exact point designated by any, with the exception of the Peach Bottom R.R., I would say that the top of west rail opposite south line of passenger station, N. C. R.R., York, is 376 feet above mid tide, Chesapeake Bay.

TABLE 120.
PENNSYLVANIA RR.

Frederick Division.

| STATIONS. | Mean tide. | Ocean level. | Dist. from York. |
|--|--------------|--------------|------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| York, Junction with Northern Central; with York Branch of Columbia RR.; and with Peach Bottom, (See Tables 5, 109, 119,) | 365 | | 0 |
| Codorus Creek, | 357 | | |
| Graybill's, | 426 | | 5 |
| Bair's, | 452 | | |
| Spring Forge, | 455 | | |
| Menges' Mill, | 455 | | |
| Iron Bridge, | 496 | | 14 |
| Jacobs' Mill, | 504 | | |
| RR. Crossing, Hanover Junction and Gettysburg RR. Crosses at grade, (See Table —,) | 607 | | |
| Hanover, | 599 | | 18 |
| Conewago Bridge, | 546 | | |
| Littlestown, | 619 | | 25 |
| Bridge, | 623 | | |
| State Line, | 540 | | |
| Piney Creek, | 505 | | |
| Galt's | 486 | | |
| Taneytown, | 493 | | 33 |
| RR. Crossing, Western Maryland RR., but not at grade, (Table 144,) | 426 | | |
| Ladiesburg, | 464 | | 41 |
| New Midway, | 458 | | |
| Woodsborough, | 400 | | 45 |
| Georgetown, | 290 | | |
| Ritter's, | 301 | | |
| Harmony Grove, | 310 | | |
| Frederick, | 280 | | 56 |
| B. & O. Junction Connection with Baltimore and Ohio RR., (See Table 145,) . . . | 375 | | |

Levels of the Frederick Division, Pa. RR., were copied from a profile of the road in the office of the Pa. RR. at Philadelphia, by permission of Mr. W. H. Brown, Engineer for Maintenance of Way.

Datum: Mean tide at Baltimore.

TABLE 121.
CUMBERLAND VALLEY RR.

| STATIONS. | High tide. | Ocean level. | Dist. from Harrisburg. |
|---|--------------|--------------|---------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Harrisburg, <i>Junction with Penna. RR. and with North- ern Central RR., (See Table 109,)</i> | 315 | 322 | 0 |
| Susquehanna Bridge, west end, <i>Bridgeport,</i> | 350 | 357 | 1.5 |
| Shiremanstown, | 429 | 436 | 5.5 |
| Mechanicsburg, | 420 | 427 | 8.5 |
| Dillsburg Junction, <i>Dillsburg Junction, (Table 122,) . . .</i> | 420 | 427 | 9 |
| Kingston, | | | 12.5 |
| Middlesex, | | | 15 |
| South Mountain RR. Junction, <i>Junction with Baltimore and Ohio RR.,</i> | 451 | 458 | 18 |
| Carlisle, | 470 | 477 | 18.5 |
| Greason's, | | | 24.5 |
| Newville, | 526 | 533 | 30.5 |
| Oakville, | | | 34.5 |
| Shippensburg, | 647 | 654 | 41 |
| Summit, | 776 | 783 | |
| Scotland, | | | 47 |
| Mont Alto Junction, <i>Mont Alto RR. Junction, (See Table 123,)</i> | 707 | 714 | 48 |
| Chambersburg, | 611 | 618 | 52 |
| Marion, | | | 58 |
| South Pennsylvania Junction, <i>Southern Penna. RR. Junc- tion, (See Table —,) . . .</i> | 625 | 632 | 59 |
| Greencastle, | 578 | 585 | 63 |
| State Line, | | | 68 |
| Hagerstown, | 565 | 572 | 74 |
| Falling Waters, | | | 85 |
| Potomac Bridge, | 369 | 376 | |
| Beddington, | | | 88 |
| Martinsburg, <i>Junction with Baltimore and Ohio RR., (Table 145,)</i> | 457 | 634 | 94 |

Levels on the Cumberland Valley RR. were furnished by Mr. J. B. Dougherty, Engineer of the road at Chambersburg.

Datum: Originally a point on the Penna. RR. at Harrisburg, foot of Market street, 315 feet above high water at Philadelphia.

TABLE 121b.

HARRISBURG AND VICINITY.

| STATIONS. | Ocean level. |
|---|--------------|
| | <i>Feet.</i> |
| Harrisburg, <i>Top of north rail, main east-bound track, centre of Market street, (Pa. R.R.)</i> | 321.17 |
| <i>Top of north rail, west line of State street, (Pa. R.R.)</i> | 327.12 |
| <i>Top of rail opposite 106th mile post, (Pa. R.R.)</i> | 329.77 |
| <i>Top of rail at weighing scales, west line of house, near 106th mile post,</i> | 334.02 |
| <i>Top of north witness stone to Meridian post, near the east entrance to the State Capitol building,</i> | 364.52 |
| <i>Bench mark on sandstone coping, near base of column S. E. corner of vestibule, east entrance to State Capitol building, (marked thus +),</i> | 368.17 |
| <i>Bench mark on slaty limestone rock, in river bed, about 20 feet south from south line of C. V. R.R. bridge, and 60 feet east from first pier, 2 feet above low water mark,</i> | 292.41 |
| <i>Top of south rail east end of C. V. R.R. bridge,</i> | 332.47 |
| <i>Top of south rail, west end of C. V. R.R. bridge,</i> | 353.24 |
| <i>Bench mark on projecting course of stone-work at base of first pier, S. W. corner, west end, of C. V. R.R. bridge,</i> | 296.98 |

The above elevations are copied from the notes of Mr. Chas. W. Ames, 2d Geological Survey of Pennsylvania, May, 1877, and are based upon the elevation of the curbstone at lamp post in front of the U. S. Hotel, 313.54 +7=320.50 above ocean, as found in the notes of the Pa. R.R. survey at the office of the Pa. R.R. Co. in Philadelphia.

TABLE 122.

MECHANICSBURG AND DILLSBURG R.R.

| STATIONS. | High tide. | Ocean level. | |
|---|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Mechanicsburg Junction with Cumberland Valley R.R. at Mechanicsburg, 8.5 miles west of Harrisburg, (See Table 121,) | 420 | 427 | |
| Dillsburg, | 536 | 542 | |

Levels on the Mechanicsburg and Dillsburg R.R. were copied from notes in possession of Mr. J. B. Dougherty, Assistant Engineer on the Cumberland Valley R.R., at Chambersburg, Pa.

Datum: That of the Pa. R.R., high tide at Philada.

TABLE 123.
MONT ALTO RR.

| STATIONS. | High tide. | Ocean level. | Dis. from C. V. RR. Junc. |
|---|--------------|--------------|---------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| C. V. RR. Junction, <i>Junction with Cumberland Valley RR. near Chambersburg,</i> . . . | 707 | 714 | 0 |
| Summit, <i>between C. V. RR. and Conococheague Creek,</i> . . | 732 | 739 | .5 |
| Brookside, <i>at crossing of creek,</i> | 700 | 707 | 2 |
| Woodstock, <i>at crossing of creek,</i> | 708 | 715 | 2.5 |
| Chambersburg Turnpike, <i>Chambersburg and Gettysburg Turnpike,</i> | 740 | 747 | 6 |
| Pond Ore Bank, | 875 | 882 | 8 |
| Mont Alto, <i>Near the Furnace,</i> | 961 | 968 | 10.5 |

Levels on the Mont Alto RR. were furnished by Mr. George B. Wiestling, Engineer and Superintendent.

Datum is "Elevation of rail at foot of Market street, Harrisburg, 315.2 above high tide in Schuylkill river at Philadelphia."

This road runs to Mont Alto Furnace, at the west foot of the South Mountain.

TABLE 124.
SUMMIT BRANCH RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Millers'g. |
|---|--------------|--------------|-----------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Millersburg, <i>on the Susquehanna River, east side; junction with Northern Central Railroad,</i> . . | 397 | | 0 |
| Elizabethville, | | | 3 |
| Cross-Road, | 662 | | 8 |
| Lykenstown, | 677 | | 14 |
| Wiconisco, | | | 15 |
| Big Lick Colliery, | | | 17 |
| Williamstown, <i>Summit Branch Colliery. (Connection broken for several miles with the Railroad from Brookside, past Good Spring, to Tremont and Pottsville,)</i> | 1127 | | 20 |

Levels of the Summit Branch RR. were furnished by Mr. W. E. Ray, Superintendent of the RR., and cannot be relied upon as being entirely correct ; but it is the only record which could be found of the road.

This road is called also the Lykens Valley RR.

Datum : Mean tide at Baltimore.

TABLE 125.

SELINGSGROVE AND NORTH BRANCH RR.

| PROPOSED STATIONS ON LOCATION LINE; ROAD NEVER BUILT. | Assumed Elevation. | Ocean Level. |
|---|-----------------------|-----------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Northumberland, <i>intersection with Bloomsburg Division D. L. & W. RR. at Northumberland, (See Tables 91 and 129,)</i> | 100 | 452.2 |
| River Road, <i>opposite Northumber- land,</i> | 86.4 | 438.6 |
| Keensville, | 84.9 | 447.1 |
| Selinsgrove, <i>center of Pine street,</i> . | 88.7 | 440.9 |
| Burns dwelling house, | 67.9 | 420.1 |
| Pa. Canal, <i>top of mason work abut- ment of aqueduct, 2½ miles below Selinsgrove, crossing Pennscreek,</i> | 70.6 | 422.8 |
| B. M., No. 16, <i>spike driven in tele- graph pole, just above Port Trev- erton,</i> | 74.7 | 426.9 |
| Port Trevorton RR. Track, | 75.9 | 428.1 |
| Herrold's Saw-Mill, | 63.3 | 415.5 |
| B. M., No. 18, <i>below Port Trevor- ton, near two dwelling houses, on root of apple tree, 300' from ca- nal,</i> | 72.6 | 424.8 |
| Wentzel's Station, | 66.3 | 418.5 |
| McKee's Half Falls, | 63.1 | 415.3 |
| Rine's Store, | 60.2 | 412.4 |
| B. M., No. 21, <i>1500' south of Benne- ville Kramer's house, on root of wild cherry tree,</i> | 60.6 | 412.8 |
| Mahontonga Creek, <i>surface of water, ordinary stage,</i> | 38.2 | 390.4 |
| B. M., No. 23, <i>900' north of Hoo- ver's hotel, on chestnut tree,</i> . . . | 61.5 | 413.7 |
| B. M., No. 24, <i>2,000' south of "Dry Saw Mill" Hotel, piece of horse shoe, driven in telegraph pole,</i> . | 54.9 | 407.1 |
| B. M., No. 25, <i>500' south of Mc Cor- mick's barn, on root of elm tree,</i> | 50.9 | 403.1 |

| | | |
|---|--------|-------|
| Liverpool, center of <i>Market street</i> , | 57.3 | 409.5 |
| Blattenberger's Mill, | 34.8 | 387 |
| Blattenberger's Creek, surface of water, | 16.4 | 368.6 |
| B. M., No. 27, 900' north of stone hotel, on root of black walnut tree, | 31.4 | 383.6 |
| Montgomery's Creek, surface of water, | 14.5 | 366.7 |
| Girty's Notch Hotel, | 26.2 | 373.4 |
| B. M., No. 28, point of rocks, foot of Girty's Mountain, pike driven in telegraph pole, | 19.1 | 371.3 |
| New Buffalo, water in mill race, . . | 24.6 | 376.8 |
| Buffalo Creek, surface of water, . . | 8.5 | 360.7 |
| B. M., No. 31, 700' south of J. Steel's dwelling house, on root of black walnut tree, | 18 | 370.2 |
| Pittsburg Turnpike Crossing, | 15.2 | 367.4 |
| B. M., No. 33, 600' south of Pitts- burg turnpike crossing, on root of hickory tree, on river bank, . | — 1 8 | 350.4 |
| Juniata River, | — 11.6 | 340.6 |
| Juniata Canal, on towing path, Ju- niata Canal, (<i>Table 115</i>), | 18.4 | 370.6 |
| Pa. R.R., on cross tie, Pa. R.R., near Duncannon, | 23.5 | 375.7 |
| B. M., No. 34, on top of locust stump, at edge of embankment of Pa. R.R., I, | 19.6 | 371.8 |

Elevations on the line of the Selinsgrove and North Branch R.R. and of the Mifflintown Branch of the same, were copied from notes in possession of Mr. W. A. Meeker, at Selinsgrove, Pa.

NOTE.—This R.R. has never been built. Only the preliminary line levels at the points named are given in the following table.

The line starts in Northumberland, at the terminus of the Bloomsburg Division of the Delaware, Lackawanna & Western R.R., crosses the mouth of the West Branch Susquehanna, and keeps down the right bank of the Susquehanna River to the mouth of the Juniata River.

The other branch of the line strikes across country from Selinsgrove to the Juniata River at Mifflintown. (*Table 126*.)

Datum: Pa. R.R. at Harrisburg, 320.54 above Atlantic Ocean, and the corrections have been made to make the elevations conform to the elevation of the Bloomsburg Division of the D. L. & W. R.R., at Northumberland, as determined by Mr. Chas. W. Ames, May, 1877, viz: 452.2 above Ocean, 352.2 has been added to each elevation, as furnished by Capt. Meeker.

TABLE 126.
MIFFLINTOWN BRANCH S. AND N. RR.

| STATIONS. | Assumed Elevation. | Ocean Level. | |
|--|-----------------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| B. M., No. 1, <i>Top of mile post No. 7, S. & L. RR., (See Table 125,)</i> | 101.2 | 453.4 | |
| Kautz P. O., <i>Water's edge, ordinary low water, Middle Creek,</i> | 95.5 | 447.7 | |
| Miller's Mill, | 134.4 | 486.6 | |
| Freeburg, | 157.2 | 509.4 | |
| Apple's Brick House, | 205.8 | 558 | |
| Road, <i>Leading from Middleburg to Tremont,</i> | 263 | 615.2 | |
| Cross Creek, | 286.5 | 638.7 | |
| B. M., No. 13, <i>1300' west of Brick School House, root of white oak tree,</i> | 375 | 727.2 | |
| Shelley's Saw-Mill, <i>Water's edge, head of Shelly's saw-mill pond,</i> | 451.4 | 803.6 | |
| Shelly's Summit, | 453.2 | 804.4 | |
| Richfield, | 412.6 | 764.8 | |
| B. M., No. 14, <i>Near rivulet,</i> | 408.7 | 760.9 | |
| Cherryhill School House, <i>Public road crossing,</i> | 366.8 | 719 | |
| Evansdale Summit, | 399 | 751.2 | |
| Haldeman's Store, <i>Public road from Evansburg to Foutz Valley, opposite Haldeman's store,</i> | 377.4 | 729.6 | |
| Bunkertown Church, <i>In public road, near Bunkertown Church,</i> | 350.3 | 702.5 | |
| Bunkertown, | 354.3 | 706.5 | |
| Little Lost Creek, <i>Surface of water,</i> | 355.4 | 707.6 | |
| McAlisterville, | 308.6 | 660.8 | |
| Leonard's Barn, | 262.9 | 615.1 | |
| Wilson's Mill, | 227.2 | 579.4 | |
| Wilson's Store, | 219.5 | 571.7 | |
| Main Road, <i>In main road from McAlisterville to Mifflintown, one mile west of Oakland mills,</i> | 224 | 576.2 | |
| Banks Summit, | 270.6 | 622.8 | |
| Happy Hollow School House, <i>Surface of water, creek or run, west of Happy Hollow School House,</i> | 160.5 | 512.7 | |
| Daniel Seiber's, <i>Surface of water in creek at D. Seiber's,</i> | 137.3 | 489.5 | |

| | | | |
|---|-------|-------|--|
| Terminus of line, <i>Mifflintown, on large peg, with nail driven near corner of stable, at fence-post, east bank of Juniata River, I,</i> | 109.2 | 461.4 | |
|---|-------|-------|--|

NOTE.—See last table, 125, for datum.

TABLE 126 $\frac{1}{2}$.

PROPOSED RR. LINE FROM PORT ROYAL TO THE POTOMAC.

(*Selinsgrove and N. B. R.R.*)

| STATIONS. | Assumed Datum. | Ocean Level. | Bench Mark. |
|---|----------------|--------------|-------------|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Top of Penn. R.R. rail at Port Royal, | 94.00 | 441 | |
| Summit, main divide between the Potomac and Susquehanna waters at Knobsville, head of Sheepskin Hollow, (just before entering the north end of McConnellsburg Cove, | 717.90 | 1065 | |
| White oak, near station 2799, (from the Mifflin Terminus on the Juniata, going south in Knobsville Narrows, | 609.29 | 956 | 30 |
| Maple, near station 2875, Wagner's farm-house, | 634.34 | 981 | 31 |
| Fore's Summit, between 31 and 34, at station 2946, | 716.20 | 1063 | |
| Elm, Bell's Narrows, station 2962, | 693.97 | 1041 | (Sic.)34 |
| Locust near station, 3009, | 622.66 | 968 | (Sic.)32 |
| Elm, at McConnellsburg, near station 3115, twenty feet west of the stone bridge of the pike, north side of pike, (<i>about 15 feet lower than the hotel in McConnellsburg,</i>) | 518.13 | 865 | 33 |
| White oak at J. Kendall, Sr.'s, near station 3222, | 469.36 | 816 | 35 |
| Elm at Judge Logan's, near station 3335, | 429.49 | 876 | 36 |

The above notes were kindly furnished to J. P. Lesley, May 15, 1877, at McConnellsburg, by Captain Meeker, then carrying his line past the town southwards.

The *assumed datum* of 94' below the top of rail of Penn'a RR., at Port Royal, three miles below Mifflintown, where the line from the Susquebanna river was intended to cross the P. RR.—would be, according to Table 1, $441' - 94' = 347'$, which figure is added to Captain Meeker's figures to make the second column.

Mr. Greathead, of McConnellsburg, informed me that Mr. James McClure, former engineer of the Penn. RR., leveled (with a Locke level) from his door-step (next house east of the hotel) along the turnpike to Chambersburg, (*not* Mercersburg,) and made the summit of that pike, where it crossed the mountain, (if he remembered rightly,) 1192', or, approximately above Ocean level, $1192' + 15' + (\text{Elm, } 33)865' = \dots 2072'$.

TABLE 127.
SHAMOKIN BRANCH, N. C. RR.

| STATIONS. | Above Tide. | Ocean Level. | |
|--|--------------|--------------|--|
| | <i>Feet.</i> | | |
| Sunbury Junction, <i>Junction with N. C. R. W., at Sunbury, (Tables 109, 110,)</i> | 442 | | |
| Snydertown, | 497 | | |
| Shamokin, | 738 | | |
| Lancaster Branch, <i>Junction with Lancaster Branch,</i> | 831 | | |
| Mount Carmel, | 1054 | | |
| End of Road, | 1090 | | |

The elevations on Shamokin Branch of the Northern Central RR. were furnished by Mr. A. B. Starr, Assistant Engineer P. & E. RR.

Datum: Mean tide, Baltimore.

TABLE 128.
PHILADELPHIA AND ERIE RR.
Old Survey.

| STATIONS. | Above Tide. | Above Tide. | Difference |
|----------------------------------|--------------|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Sunbury, | 423 | 428 | + 5 |
| Milton, | 451 | 458 | + 7 |
| Williamsport, | 506 | 510 | + 4 |
| Lock Haven, | 552 | 539 | + 7 |
| De Grano, | 716 | | |
| 2d Fort Sinnamahoning, | 787 | 798 ? | + 11 |
| Emporium, | 1011 | 1015 | + 4 |
| Foot of Maximum Grade, . . . | 1330 | | |

| | | | |
|--|------|------|-----|
| West Creek Summit, | 1682 | 1678 | — 4 |
| St. Mary's, <i>Difference of 21 feet probably to be accounted for on the supposition that two differ- ent points are indicated, the gradients here being very steep,</i> | 1628 | 1649 | +21 |
| Foot of Maximum Grade, | 1518 | | |
| Ridgway, <i>head of the Clarion River, at the forks,</i> | 1387 | 1376 | — 9 |
| Johnsonburg, | 1429 | 1424 | — 5 |
| Wilcox, | 1501 | 1509 | + 8 |
| Foot of Maximum Grade, | 1525 | | |
| Clarion Summit, | 2006 | | |
| Head of Two-Mile Run, | 1914 | | |
| Foot of Maximum Grade, | 1456 | | |
| Sheffield, | 1324 | 1326 | + 2 |
| Dutchman's Summit, | 1393 | | |
| Warren, | 1189 | 1183 | — 6 |
| Irvine, | 1162 | 1157 | — 5 |
| Youngsville, | 1203 | 1200 | — 3 |
| Pittsfield, | 1236 | 1233 | — 3 |
| Garland, | 1298 | 1297 | — 1 |
| Spring Creek Station, | 1381 | 1384 | + 3 |
| Columbus, | 1388 | 1389 | + 1 |
| Corry, | 1416 | 1420 | + 4 |
| Logan's Summit, | 1429 | | |
| Lovell's, | 1363 | 1363 | 0 |
| Concord, | 1372 | 1374 | + 2 |
| Union, | 1259 | 1259 | 0 |
| Le Bocuf, | 1205 | 1207 | + 2 |
| Waterford, | 1181 | 1182 | + 1 |
| Jackson, | 1218 | 1219 | + 1 |
| Langdon's, | 1123 | 1124 | + 1 |
| Belle Valley, | 994 | 996 | + 2 |
| Erie Depot, | 573 | | |
| Lake Erie Surface, | 565 | | |

NOTE.—In the above table some levels, according to a profile made by John F. Burgin, Civil and Topographical Engineer, in 1862, are compared with levels of the same points found in Table 129.

Column 1 shows Mr. Burgin's figures.

Column 2 shows the office figures.

The above table is published merely for comparison with the tables following, which relate to levels on the same line of road. There is no very good reason for placing confidence in the accuracy of the elevations, so far as they relate to the stations or towns (in the above table) at the present time.

Burgin's levels were taken on a located line entirely through the woods.

No clearing had been done. Burgin had general superintendence of the work, and was topographer of the whole line; but the actual work was done by several different parties. The above table is not considered reliable by any engineer with whom I have consulted on the subject.

TABLE 129.
PHILADELPHIA AND ERIE RR.

| STATIONS. | Mean Tide. | Corrected Levels. | Dist. from Sunbury. |
|---|--------------|-------------------|---------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Sunbury, <i>Junction of Shamokin Branch of the Northern Central RR., (Table 109),</i> | 428.30 | 444 | 0 |
| D., H. & W. RR. Junc., <i>Junction Danville, Hazleton and Wilkesbarre RR., (Table 77),</i> | 436.10 | 451 | |
| Northumberland, <i>Junction of Delaware, L. and W. RR., (Table 91),</i> | 439.30 | 454 | 2 |
| Montandon, <i>Junction of Lewisburg, Centre and Spruce Creek RR., (Table 14),</i> | 446.60 | 462 | 9 |
| Catawissa RR. Crossing, <i>Crossing of Catawissa RR., near Milton, (Tables 52, 53),</i> | 454.50 | 469 | 12 |
| Milton, | 458.30 | 473 | 13 |
| Watsonstown, | 465.62 | 481 | 17 |
| Dewart, | 470.40 | 485 | 19 |
| Catawissa RR. Crossing, <i>Crossing Catawissa RR., near Montgomery, (Tables 52, 53),</i> | 473.82 | 490 | |
| Montgomery, | 474.10 | 490 | 24 |
| Muncy, | 502.75 | 519 | 28 |
| Catawissa RR. Crossing, <i>Crossing Catawissa RR. below Williamsport, (Tables 52, 53),</i> | 514.42 | 531 | |
| Williamsport, | 510.43 | 527 | |
| W. & E. (N. C.) Railroad Junction, <i>Junction with Northern Central R. W., near Williamsport, (Table 132),</i> | 516.02 | 532 | |
| Newberry, | 513.20 | 529 | 42 |
| Linden, | 517.21 | 533 | 45 |
| Susquehanna, | 516.60 | 534 | 46 |
| Jersey Shore, | 576.7 | 593 | 52 |
| Pine, | 554.6 | 565 | 57 |
| Wayne, | 554.5 | 572 | 60 |

| | | | |
|--|---------|-------|-------|
| Lock Haven, <i>Junction with Bald Eagle Valley RR., (Table 16,) .</i> | 538.91 | 556 | 65 |
| Queen's Run, | 566 | 584 | 69 |
| Farrandsville, | 565 | 583 | 70 |
| Ferney, | 576.44 | 594 | 75 |
| Glen Union, | 587 | 605 | 78 |
| Whetham, | 600.80 | 619 | 80 |
| Ritchie, | 614.34 | 632 | 83 |
| Hyner, | 626.5 | 644 | 86 |
| North Point, | 641.02 | 659 | 89 |
| Renova, | 653.90 | 672 | 92 |
| Westport, | 673 | 691 | 98 |
| Cook's Run, | 691.43 | 709 | 102 |
| Keating, | 699.7 | 718 | 105 |
| Wistar, | 720.72 | 739 | 107 |
| Round Island, | 737 | 755 | 110 |
| Grove, | 754.40 | 772 | 114 |
| Sinnemahoning, | 775.5 | 794 | 117 |
| Bennett's Br. Extension, <i>Junction with the Bennett's Branch Extension of Allegheny Valley RR., (Tables 165, 166,)</i> | 795 | 813.8 | |
| Driftwood, | 797.75 | 816 | 120 |
| Huntley, | 842.93 | 861 | 124 |
| Sterling, | 896.38 | 914 | 129 |
| Cameron, | 945.73 | 964 | 133 |
| B., N. Y. & P. RR., <i>Junction with the Buffalo, New York and Philadelphia RR., (Table 134,) . .</i> | 1003.09 | 1021 | 138 |
| Emporium, | 1014.99 | 1033 | 139 |
| West Creek, | 1091.4 | 1109 | 141 |
| Beechwood, | 1225.66 | 1244 | 148 |
| Rathbon, | 1299.18 | 1317 | 150 |
| Hemlock, | 1446.05 | 1464 | 153 |
| West Creek Summit, | 1677.64 | 1696 | 155 |
| St. Mary's, | 1649.50 | 1667 | 160 |
| Scahonda, | 1503.90 | 1522 | 163 |
| Daguschahonda, <i>Here the Daguschahonda RR. joins. (See Table 135,)</i> | 1461.95 | 1480 | 165 |
| Shawmut, <i>Shawmut RR. No levels,</i> | 1408.56 | 1427 | 167 |
| Ridgway, | 1375.7 | 1393 | 170 |
| Johnsonburg, | 1423.52 | 1442 | 177.5 |
| Wilmarth, | 1428.80 | 1447 | 178.3 |
| Wilcox, | 1508.52 | 1527 | 184 |
| Dahoga, | 1586.75 | 1605 | 187 |
| Clarion Summit, | 2006.3 | 2024 | 190 |
| Kane, | 2002.83 | 2014 | 193 |

| | | | |
|--|---------|-------|-----|
| Wetmore, | 1792.63 | 1804 | 199 |
| Ludlow, | 1591.55 | 1603 | 202 |
| Roy Stone, | 1403.75 | 1415 | 206 |
| Sheffield, | 1325.70 | 1337 | 209 |
| Tiona, | 1348.03 | 1359 | 212 |
| Clarendon, | 1385.46 | 1396 | 215 |
| Stoneham, | 1335.93 | 1347 | 217 |
| Warren, (<i>Table 176</i>), | 1175.4 | 1186 | 222 |
| Pittsburg, Titusville and Buffalo R.R. Crossing, (<i>Tables 171, 172,</i> <i>173</i>), | 1158.80 | 1170 | |
| Irvineton, | 1161 | 1172 | 228 |
| Youngsville, | 1199.85 | 1211 | 230 |
| Pittsfield, | 1233.31 | 1244 | 234 |
| Garland, | 1297 | 1308 | 238 |
| Spring Creek, | 1383.85 | 1395 | 244 |
| Columbus, | 1390.3 | 1401 | 249 |
| B. C. & P. R.R. Crossing, <i>Cross-</i> <i>ing of the Buffalo, Corry and</i> <i>Pittsburg R.R.</i> , (<i>Table 179</i>), | 1429.20 | 1440 | |
| Corry, | 1419.58 | 1431 | 251 |
| A. & G. W. R.R. Crossing, <i>Cross-</i> <i>ing of the Atlantic and Great</i> <i>Western R.R.</i> , (<i>Table 196</i>), | 1415.92 | 1427 | |
| Lovell's, | 1362.90 | 1364 | 254 |
| Concord, | 1373.80 | 1384 | 256 |
| Union, | 1258.63 | 1270 | 262 |
| LeBoeuf, | 1206 | 1217 | 265 |
| Waterford, | 1181.72 | 1193 | 269 |
| Jackson's, | 1218.70 | 1230 | 275 |
| Langdon's, | 1123.3 | 1135 | 279 |
| Belle Valley, | 995.96 | 1007 | 281 |
| L. S. & M. S. Railroad Crossing, <i>Junction with the Lake Shore</i> <i>and Michigan Southern at Erie</i> , (<i>Table 194</i>), | 675.64 | 687 | |
| Erie, <i>Center of State street at pier</i> , | 582.3 | 593 | |
| Erie, <i>Track in front of old Depot</i> , | 575.3 | 586 | |
| Erie Depot, | (573) | 584 | 288 |
| Lake Erie water*, | (565) | (573) | |

*The level of Lake Erie water was fixed by J. T. Gardner's tables (U. S. Geol. and Geographical Survey of Colorado, for 1863, p. 635,) "mean of observations from 1844 to 1857, 573.08;" adopted result at Cleveland, dependent upon repeated Erie Canal levels and U. S. Coast Survey work.

The levels on the Philadelphia and Erie R.R. were copied from the notes in the office of the company at Williamsport, Pa., by permission of Mr.

A. B. Starr, Assistant Engineer. These levels were made subsequent to 1862.

Datum : Mean tide at Baltimore.

The above table of elevations on the Philadelphia and Erie RR. has been changed, as will be noticed, by making the following additions: From Sunbury to Queen's Run they have been corrected to agree with the result of actual leveling during last summer, as seen in Table 129. From Queen's Run to Kane, I have added 18 feet to each elevation, and this agrees very nearly with the corrected elevation of the Bennett's Branch RR., Tables 165, 166, and with the levels on the Buffalo, N. Y. and Phila. RR., Table 134, (Lake Erie datum.) From Kane to Lake Erie 11 feet has been added to each elevation, on the recommendation of Mr. John F. Carll, (see below.) I think there is no doubt that the levels in the 2d column are nearer the truth than in the 1st column; yet, from Queen's Run westward, with the exception of points crossed by other lines of RR., where the elevation has been fixed with some degree of certainty, I feel no assurance in saying that the additions establish the elevation of these points beyond doubt. Mr. Starr, the engineer of the P. and E. RR., thinks there is no doubt but the road will be re-leveled during the coming summer of 1878.

TABLE 130.
PHILADELPHIA AND ERIE RR.
New Survey—Allen and Ames.

| STATIONS. | Ocean level. |
|--|--------------|
| | <i>Feet.</i> |
| Sunbury, <i>top of west rail, opposite north line of depot, R.R. bridge crossing, North Branch of Susquehanna River,</i> | 444.15 |
| <i>top of north rail, east end of bridge, . . .</i> | 452.61 |
| <i>Top of south rail, west end of bridge,</i> | 454.32 |
| Northumberland, <i>top of west rail, main track, opposite center of depot,</i> | 454.11 |
| Montandon, <i>top of south rail, opposite west end of passenger station,</i> | 462.3 |
| Lewisburg, <i>Centre and Spruce Creek R.R. Junction, top of frog at southern junction, (Table 14,)</i> | 462.75 |
| Milton, <i>crossing of Catawissa R.R., (Tables 52, 53,)</i> | 469.43 |
| Milton, <i>top of west rail, opposite south line of depot,</i> | 473.35 |
| Watsontown, <i>top of rail opposite north line of depot,</i> | 481.85 |
| Dewart, <i>top of west rail opposite south line of depot,</i> | 485.62 |
| Montgomery, <i>top of west rail, north end of P. & E. R.R. bridge crossing Susquehanna River,</i> | 489.9 |
| Montgomery, <i>crossing Catawissa R.R., (Tables 52, 53,)</i> | 489.9 |
| Montgomery, <i>top of west rail, opposite north line of station,</i> | 489.8 |

| | |
|---|--------|
| Muncy, <i>top of west rail, opposite north line of passenger station,</i> | 519.58 |
| Williamsport, <i>crossing Catawissa RR. near Pa. Canal and Susquehanna River,</i> | 531.25 |
| Williamsport <i>top of north rail, west end of P. & E. RR. bridge crossing river,</i> | 531.33 |
| Williamsport, <i>surface of water in river under bridge,</i> | 498.1 |
| Williamsport, <i>top of north rail, opposite west line of Penn Street Station,</i> | 527.46 |
| Williamsport, <i>bench mark on stone coping of court house fence, corner of Third and Pine streets,</i> | 524.38 |
| Williamsport, <i>top of south rail, opposite east line of main depot,</i> | 526.92 |
| Williamsport Junction with N. C. RR., (<i>Table 132.</i>) | 532.4 |
| Newberry, <i>top of north rail, opposite west line of station,</i> | 529.79 |
| Linden, <i>top of north rail, opposite east line of station,</i> | 533.83 |
| Linden, <i>top of south rail, east end of bridge crossing Susquehanna River,</i> | 536.24 |
| Linden, <i>surface of water in river,</i> | 508 |
| Susquehanna, <i>top of south rail, opposite east line of station,</i> | 534.37 |
| Jersey Shore, <i>top of south rail, opposite east line of station,</i> | 593.65 |
| Pine, <i>top of rail at switch in front of "Hotel,"</i> | 565.77 |
| Wayne, <i>top of rail opposite east line of station,</i> | 572.67 |
| Lock Haven, <i>eastern frog, junction with Bald Eagle Valley RR. (Table 16.)</i> | 556.33 |
| Lock Haven, <i>top of rail opposite center of passenger depot,</i> | 557.23 |
| Queen's Run, <i>top of north rail, opposite east line of station,</i> | 583.32 |

Elevations on the Philadelphia and Erie RR. from Sunbury to Queen's Run, as determined by Mr. Chas W. Ames, 2d Geological Survey of Pennsylvania, during the month of May, 1877. These elevations depend upon the supposition that the height (as given by the Pa. RR. notes) of the curbstone in front of U. S. Hotel, Harrisburg, $313.54 + 7 = 320.54$, is correct. When it is taken into consideration that this level continued to Clark's Ferry dam and to Shamokin dam, at Sunbury, and checking so nearly with the elevations of both those points, as given by Mr. Wierman, there is reason to believe that the elevation of the Pa. RR. at Harrisburg, as given in their notes, is reliable. There is, therefore, no reasonable doubt but the heights in the above table are in the main correct.

TABLE 131.
MUNCY CREEK RR.

| STATIONS. | Mean tide. | Ocean levels. |
|--|------------|---------------|
| | Feet. | Feet. |
| Hall's Station, on Catawissa RR., east bank of river, (Table 52), | 512.7 | 512.70 |
| *Hughesville. Mr. B. Morris Ellis says: "This station is 80 feet higher than the Muncy Station (west side of river) on P. & E. RR.," called, in Table 130, 519.58, and therefore Hughesville is 599.58. Accordingly, 116.58' is added to Mr. Ellis' 483, and therefore to all other figures in the first column, to make the second, | 483 | 599.58 |
| Picture Rock, | 551 | 667.58 |
| Tivola, | 591 | 707.58 |
| Muncy Bottoms, | 675 | 791.58 |
| Sonestown, | 829 | 945.58 |
| McNeal's Summit. This is the dividing ridge, between the Loyalsock and Muncy creeks, which head within one fourth mile of each other. It is known as McNeal's Summit, an engineer of that name having established a "bench" at this point many years since. It is two miles south of the town of Laporte.—B. Morris Ellis, . | 1676 | 1792.58 |

The levels on the Muncy Creek RR. were furnished by Mr. B. Morris Ellis, Treasurer.

Datum: Catawissa (Reading) RR. Mid tide at Philadelphia.

This RR. line runs north-east up Muncy creek to the top of the Allegheny or Great North Mountain table land of Sullivan county.

POINTS IN SULLIVAN COUNTY furnished by Mr. B. Morris Ellis, of Hughesville, Pa. Datum above tide.

In front of the hotel at Long Pond, in Cully township, 2235'

Highest known point in Sullivan county. Turnpike, one mile west of Long Pond, 2285'

Lewis Lake, or Eagle's Meare, 1726'

TABLE 132.

WILLIAMSPORT AND ELMIRA RR.*(Now Northern Central R.R.)*

| STATIONS. | Mean tide. | Ocean level. | Dist. from Williamsport. |
|--|--------------|--------------|-----------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Williamsport, <i>Junction with Philadelphia and Erie RR. and the elevation of this point, as determined by Mr. Chas. W. Ames, May 19, 1877, is 532.4 above Atlantic Ocean, Pa. RR. datum, (Table 130.)</i> | 540 | | 0 |
| Cogan Valley, | | | 8 $\frac{1}{2}$ |
| Crescent, | | | 10 $\frac{1}{2}$ |
| Trout Run, | 694 | | 14 |
| Bodine's, | | | 20 |
| Ralston, | 860 | | 24 $\frac{1}{4}$ |
| Roaring Branch, | 940 | | 26 $\frac{1}{2}$ |
| Carpenter's, | 1201 | | 34 |
| Grover, | 1220 | | |
| Canton, | 1261 | | 40 |
| Minnequa, | 1230 | | 41 |
| Alba, | 1349 | | 43 $\frac{1}{2}$ |
| Granville, | 1368 | | 47 |
| Granville Summit, | 1393 | | |
| Troy, | 1148 | | 53 |
| Columbia Cross-Roads | 1148 | | 57 $\frac{1}{2}$ |
| Snedeker's, | | | 62 $\frac{1}{2}$ |
| Gillett's, | 1187 | | 65 $\frac{1}{2}$ |
| New York State Line, | 1106 | | 69 |
| State Line Junction, <i>Junction with extension of Tioga RR., (See Table 102.)</i> | 908.5 | | |
| Elmira, <i>crosses New York and Erie RR., (Table 98.)</i> | 865 | | 78 |
| Horse Heads, | 865 | | 84 |
| Pine Valley, | 865 | | 88 |
| Mill Port, | | | 91 |
| Croton, | | | 93 |
| Havana, | 447 | | 97 |
| Watkins', | 447 | 453 | 100 |
| Rock Stream, | | | 108 |
| Starkey, | 804 | 810 | 111 |
| Himrod's, | 793 | 799 | 115 |
| Milo, | 851 | 857 | 119 |
| Pennyman, | 750 | 756 | 123 |

| | | | |
|--|-----|-----|-----|
| Bellona, | 857 | 863 | 129 |
| Hall's | | | 133 |
| Stanley, <i>Junction with Ontario and Southern R.R., (See Table —,)</i> | 898 | 904 | 136 |
| Hopewell, | 844 | 850 | 141 |
| Canandaigua, <i>connects with N. Y. Central and Canandaigua and Tonawanda R.R., (See Table —,)</i> | 734 | 740 | 147 |

Levels on this Northern Division of the Northern Central R.R., from Williamsport to Canandaigua, were copied from a profile in the office of the Company at Elmira. This road runs north up Lycoming creek.

Datum: Mean tide at Baltimore, Md.

NOTE.—The elevations from Williamsport to Elmira are taken from an old profile, which Mr. C. P. Perkins, Assistant Engineer, *supposes is correct*. The elevations from Elmira to Watkins are also from a profile of doubtful accuracy, but probably not very far wrong. Those from Watkins northward are from a survey recently made, surface of water in Seneca Lake being taken as 441 feet above tide. I have added 6 feet to each elevation from Watkins northward, for the following reasons: In the vols. of Natural History, 4th District of N. Y., page 411, by Prof. James Hall, the elevation is given as 447 for Seneca Lake, upon the authority of Prof. Henry, and according to a late survey on the Syracuse, Geneva & Corning R.R., (see Table 107,) Seneca Lake, according to the datum of the N. Y., C. & H. R.R., is found to be 447.46 above ocean level. Therefore, I am inclined to think that 447 is nearer the correct elevation of the above lakes than 441.

TABLE 133.

JERSEY SHORE, PINE CREEK AND BUFFALO R.R.

| STATIONS. | Tide. | Ocean Level. | Dist. from Williamsport. |
|---|--------------|--------------|-----------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Williamsport, city limit. <i>The Canal level at Williamsport, however, is 518.9 according to Tables 52, 114, 115, . . .</i> | 502 | 529 | 0 |
| Linden, (surface of canal,) . . . | 501 | 528 | 2.77 |
| Larry's Creek, (on Plank Road,) . . | 514 | 541 | 8.34 |
| Jersey Shore, (Main Street,) . . | 521 | 548 | 10 |
| Pine Creek Crossing, (Lentz,) . . | 532 | 559 | 16 |

| | | | |
|---|------|------|--------|
| Pine Creek Crossing, (Ramsey's Bend,) | 558 | 585 | 19.58 |
| Waterville, (surface Little Pine Creek,) | 587 | 614 | 22.71 |
| Jersey Mills, | 626 | 653 | 27 |
| Campbelltown, | 673 | 700 | 33 |
| Pine Cr. Crossing, (near Slate Run,) | 709 | 736 | 38 |
| Pine Cr. Crossing, (near Cedar Run,) | 760 | 787 | 43 |
| Babb's Creek Road, | 833 | 860 | 48 |
| Pine Creek Crossing, (above Marsh Creek,) | 1106 | 1133 | 65 |
| Gaines' (Water, Pine Creek,) | 1232 | 1259 | 72 |
| Kilbourne's (Water, Pine Cr.,) | 1274 | 1301 | 76.5 |
| Grade at Summit of Tunnel, | 2202 | 2229 | 92.5 |
| Coudersport, | 1634 | 1661 | 101 |
| Roulette, | 1510 | 1537 | 109.76 |
| Port Allegheny, (<i>Table 134</i> ,) | 1454 | 1481 | 117 |

Levels on the J. S. P. Cr. and Buffalo RR. were furnished by Mr. John S. Ross, Auditor. Datum: "Atlantic Ocean." This road is not yet built.

The levels on the Jersey Shore, Pine Creek and Buffalo RR. have been made to correspond with the result of the late test level run over the Catawissa RR. (by direction of Mr. W. Lorenz, Chief Engineer P. & R. RR., Dec. 20, 1877.) Not having the exact proposed point of connection of the J. S. P. C. & B. RR. with the Catawissa and Williamsport RR. at Williamsport, but as the first point given in the table is Williamsport city limit, and, as seen in Table 52, we will take the elevation as given at the terminus of the C. and W. Branch, 529.31, and will add 27 feet to each elevation in the first column for Ocean level in the second column.

TABLE 134.

BUFFALO, NEW YORK AND PHILADELPHIA RR.

| STATIONS. | +L. Erie. | Ab. Tide. | Erie RR. Correct'n. | Dist. from Empor'm. |
|---|--------------|--------------|------------------------|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Emporium, <i>on the Philadelphia and Erie RR., where the unreliable list of the P. & E. RR. makes the elevation 1003.09, (Table 129,)</i> | 448 | 1021 | 1024 | 0 |
| Shippen, | 630 | 1203 | 1206 | 8 |
| Keating, (Summit,) | 1305 | 1878 | 1881 | 16 |
| Liberty, | 1070 | 1643 | 1646 | 21 |
| Port Allegheny, | 906 | 1479 | 1482 | 24 |

| | | | | |
|---|------|------|------|-----|
| Sartwell, | 876 | 1449 | 1452 | 31 |
| Larabee's, | 905 | 1478 | 1481 | 33 |
| McK. and B. RR. Junction, (see Table 138,) . . | 901 | 1474 | 1477 | |
| Eldred, | 867 | 1440 | 1443 | 37 |
| State Line, | 867 | 1440 | 1443 | 41 |
| Portville, | 866 | 1439 | 1442 | 45 |
| Olean, | 859 | 1432 | 1435 | 51 |
| Olean, crosses N. Y. & Erie RR., (Table 98,) . . | 862 | 1435 | 1438 | 52 |
| Hindsdale, | 880 | 1453 | 1456 | |
| Ischua, | 965 | 1538 | 1541 | 60 |
| Franklinville, | 1017 | 1590 | 1593 | 71 |
| Machias, | 1080 | 1653 | 1656 | 82 |
| Yorkshire, | 882 | 1455 | 1458 | 85 |
| Arcade, | 881 | 1454 | 1457 | |
| Protection, | 807 | 1380 | 1383 | |
| Holland, | 600 | 1173 | 1176 | 95 |
| South Wales, | 414 | 987 | 991 | |
| Aurora, | 348 | 921 | 925 | 104 |
| Jamieson, | 317 | 890 | 894 | |
| Elma, | 250 | 823 | 827 | |
| Spring Brook, | 180 | 753 | 757 | |
| Ebenezer, | 63 | 636 | 640 | |
| Buffalo, | 11 | 584 | 588* | 121 |

Elevations on the B. N. Y. and P. RR. were furnished by Mr. Geo. S. Gatschell, Engineer, who writes: "Calling Lake Erie 473' above tide, *our* elevation at the crossing of the Erie Railway, at Olean, is 1435'. Erie, (RR. levels,) 1438; difference, 3'. At Buffalo, our elevation is 11' above what we took to be surface of water in Lake Erie, but I do not think it is exactly right. We assumed surface of water in Lake Erie from surface of water in Buffalo Creek, about 3 miles from the Lake. Lake Erie, 573'; our depot, 11'=584; Erie Railway, (levels,) 588; difference, 4'. You see the difference at Olean and Buffalo is very near the same. The Erie Railway track here (at Buffalo) is on about the same elevation as our track."

TABLE 135.
DAGUSCHAHONDA RR.

| STATIONS. | Profile. | P.&E.R.R. Datum. | Ocean. |
|---|--------------|---------------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| 0, Junction with P. & E. RR., . | 930 | 1462 | 1478 |
| 9, | 932.7 | 1465 | 1481 |
| 10, | 933.2 | 1465. | 1481 |
| 11, | 933.9 | 1466 | 1482 |
| 12, | 934.8 | 1467 | 1483 |
| 13, | 935.9 | 1468 | 1484 |
| 14, | 937.3 | 1469 | 1485 |
| 15, | 939.0 | 1471 | 1487 |
| 92, Surface of Shanty Run, . . | 1066.3 | 1598 | 1614 |
| 115, Dry Run surface, | 1102.0 | 1634 | 1650 |
| 175, Shelvy Run surface, . . . | 1247.6 | 1780 | 1796 |
| 197, | 1300.8 | 1833 | 1849 |
| 198, | 1302.5 | 1834 | 1850 |
| 199, | 1304.0 | 1836 | 1852 |
| 200, | 1305.3 | 1837 | 1853 |
| 201, Road at corners, | 1306.5 | 1838 | 1854 |
| 202, | 1307.6 | 1840 | 1856 |
| 203, | 1308.6 | 1841 | 1857 |
| 204, | 1309.5 | 1841 | 1857 |
| 205, | 1310.3 | 1842 | 1858 |
| 206, Bottom of Mill Creek, . . | 1302.4 | 1834 | 1850 |
| 207, | 1311.6 | 1844 | 1860 |
| 209, | 1312.6 | 1845 | 1861 |
| 240, | 1325.0 | 1857 | 1873 |
| 250, | 1325.0 | 1857 | 1873 |
| 268, Road, | 1334.0 | 1866 | 1882 |
| 270, Mill Creek surface, . . . | 1331.7 | 1864 | 1880 |
| 294, Mill Creek bottom, . . . | 1349.4 | 1881 | 1897 |
| 302, | 1366.0 | 1898 | 1914 |
| 303, | 1366.0 | 1898 | 1914 |
| 304, | 1365.7 | 1898 | 1914 |
| 305, | 1365.1 | 1897 | 1913 |
| 306, | 1364.1 | 1896 | 1912 |
| 307, Road at tunnel, | 1379.8 | 1912 | 1928 |
| 308, | 1361.2 | 1893 | 1909 |
| 319, B. M. on Summit between Mill Creek and Little Toby, . . | 1486.4 | 2018 | 2034 |
| 326, Top of "E" Vein, | 1334.9 | 1867 | 1883 |
| 328, Floor of "D" Vein, | 1327.5 | 1859 | 1875 |
| 330, Top of "C" Vein, | 1265.5 | 1797 | 1813 |
| 339, | 1307.0 | 1839 | 1854 |
| 394, | 1224.5 | 1756 | 1772 |

The Daguschahonda RR. runs from Daguschahonda, on the P. & E. RR., to the mines of the "North-Western Mining and Exchange Co.," in Elk county.

The levels were furnished by E. E. Willard, Esq., Civil Engineer and Surveyor at Ridgway, to Mr. Chas. A. Ashburner, Assistant Geologist.

TABLE 136 (a.)
McKEAN COUNTY CREST LINE.
(Surveys of Gen. Thos. L. Kane.)

| LOCALITY. | Station. | Profile. | Dalson's Datum. | Ocean Level. |
|--|----------|--------------|--------------------|-----------------|
| | | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Dalson's Bench, Howard Hill, | | 420.32 | 2222.5 | 2258 |
| Center of Big Level, State road, Howard Hill, | | | | |
| Seven Mile Summit, | 542+80 | 392.70 | 2194.9 | 2230 |
| Crossing of Wilcox and Smethport State road, | 331 | 370.55 | 2172.7 | 2208 |
| | 318+66 | 356.79 | 2159 | 2184 |
| | 1 | 256.79 | 2159 | 2184 |
| B.M. on Hemlock stump, Marvin, Summit on Wilcox and Smethport (Hamlin) State road, | 16 | 280.19 | 2182.4 | 2218 |
| Sugar Maple, N. W. corner warrant 2496, (tree blown down,) . . . | 60 | 229.22 | 2131.4 | 2166 |
| Creek on north boundary line, warrant 2496, . . | 64 | 198.44 | 2100.6 | 2136 |
| Point north of Kathrine Swamp, . . . | 77 | 292.27 | 2194.4 | 2230 |
| Head of West Branch of Warner Brook, . . . | 97 | 281 | 2183 | 2218 |
| First Summit, between Ginalsburg and Warner Brook. NOTE.— This summit is about 200 feet wide, and slopes 10 degrees each way, | 113 | 221.67 | 2123.8 | 2159 |
| Second Summit, between Ginalsburg and Warner Brook, | 117 | 212.28 | 2114.5 | 2150 |

| | | | | |
|---|-----|--------|---------|------|
| Third Summit, between Ginalsburg and Warner Brook, | 122 | 210.21 | 2112.4 | 2147 |
| Fourth Summit, between Ginalsburg and Warner Brook, | 126 | 191.34 | 2093.5 | 2129 |
| Summit, between Martin's Run and Warner Brook, | 153 | 171.24 | 2073.4 | 2109 |
| Burlingame Summit, between Ginalsburg and Warner Brook, | 165 | 163.30 | 2065.5 | 2101 |
| Old Stump, Bishop's Summit, | 168 | 171.01 | 2073.19 | 2108 |

NOTE.—Allegheny Valley Summit or Bishop's Summit, 166.55 feet above Weiderst Summit, according to General Thos. L. Kane.

Weiderst Summit is 256.79 feet below crossing of Wilcox and Smethport State Road, and Bishop's Summit is 171.01 above Weiderst Summit, according to the table, so that there is either an error in the table or in 166.55 feet of above note.

CHAS. A. ASHBURNER.

Levels and notes above were furnished by Mr. Chas. A. Ashburner. The datum will be explained at the foot of Table 136 (b.)

TABLE 136 (b.)

HOWARD'S HILL TO WEIDERT'S SUMMIT.

| LOCALITY. | Station. | Profile. | Dalson's Datum. | Ocean Level. |
|--|-----------|--------------|-----------------|--------------|
| | | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Dalson's Bench, Howard Hill, | | 420.32 | 2222.5 | 2258 |
| Top of post on highest point of Howard Hill, | | 425.48 | 2227.7 | 2263 |
| Center of Big Level (State) road, Howard Hill, | 548+80 | 392.70 | 2194.9 | 2230 |
| Toby Waters, | 482+ | 355.17 | 2157.3 | 2193 |
| Do. do. | 481+ | 355.27 | 2158.4 | 2194 |
| Second Cold Run in notch, Marvin Waters, | 441 | 364.91 | 2167.1 | 2202 |
| First Cold Spring in notch, Marvin Waters, | 429 | 377.40 | 2179.6 | 2215 |
| Seven Mile Summit, | 331 | 370.55 | 2172.7 | 2208 |
| Crossing of Wilcox and Smethport, State road, | 318+66 | 356.79 | 2159 | 2194 |

| | | | | |
|--|-----|--------|--------|--------|
| About narrowest point between Rocky Run and Seven Mile Run, | 253 | 294.42 | 2096.6 | 2132 |
| Shaddock's road, some- times called "Old Mar- vin road," | 221 | 299.79 | 2102 | 2137 |
| Notch south of Shad- dock place, | 211 | 283.09 | 2085.3 | 2121 |
| Barnes road, between Barnes and Williams- ville, | 130 | 263.74 | 2065.9 | 2101 |
| Eight Mile Spring, . . | 107 | 215.24 | 2017.4 | 2053 |
| Eight Mile Summit, . . | 95 | 203.99 | 2006.2 | 2041 |
| Bench on Joe Pistner Summit, | 69 | 162.76 | 1964.9 | 2000 |
| Bench Mark on Hemlock Post, Weidert's Sum- mit, | 0 | 100.00 | 1902.2 | 1938 |
| WEIDERT'S SUMMIT TO COBB'S BRIDGE. | | | | |
| Weidert's Summit, | | 328.12 | 1902.2 | 1938 |
| Top of post north of John Weidert's, | 70 | 278.42 | 1852.5 | 1888 |
| Corner of Bonnett's gar- den, | 48 | 356.52 | 1930.6 | 1966 |
| Pistner coal opening, . | 42 | 325.66 | 1899.7 | 1935 |
| Water at Pistner Run, in St. Mary's road, . . | 29 | 200.50 | 1774.6 | 1810 |
| Junction of St. Mary's road and road leading to Cobb's Bridge, . . | 7 | 161.31 | 1735.4 | 1771 |
| B. M. on root at Cobb's Bridge over Johnson's Run, | 0 | 100.00 | 1674.1 | 1709.5 |
| COBB'S BRIDGE TO JOHN- SONBURG. | | | | |
| Line at Cobb's Bridge, | | 360.90 | 1674.1 | 1709.5 |
| Water at Cobb's Bridge, | | 350.97 | 1664.1 | 1699.5 |
| Mouth of Sweet's Run, . | 70 | 313.33 | 1626.5 | 1662 |
| Mouth of Luce Run, . . | 50 | 215.87 | 1529 | 1564 |
| B. M. 1156, B. & B. RR. line, mouth of Johnson Run, | 39 | 165.30 | 1478.5 | 1514 |
| Mouth of Johnson Run, (Water ?) | 37 | 148.66 | 1461.8 | 1497 |

| | | | | |
|---|----|--------|--------|------|
| Crossing of Laurel Run, | 22 | 141.25 | 1454.4 | 1490 |
| Mouth of Laurel Run, . | 19 | 117.85 | 1431 | 1466 |
| Bridge seat at Johnsonburg, over Clarion River, P. & E. RR., (see Table 129,) . . . | 1 | 94.44 | 140.76 | 1443 |

RR. line located by General Thomas L. Kane, from Howard Hill, McKean county, to Johnsonburg, P. & E. RR., Elk county.

Levels in above table furnished by Mr. Chas. A. Ashburner. Mr. Ashburner says: "According to Gen'l Kane, the datum of the P. & E. RR. is 14.5 below Mr. Dalson's datum. This would make the Johnsonburg bridge seat 1393.1. I do not know upon which of the P. & E. RR. profiles this determination of Dalson's is based, but he evidently has been misled, for Johnsonburg bridge seat has an elevation of 1425 feet, instead of 1393, as given by Mr. Dalson." I have lately examined the profile of the P. & E. RR. at their office in Williamsport, and find the elevation of the western bridge seat at Johnsonburg 1425.52, and the eastern do., 1424.72. I therefore call the bridge seat at Johnsonburg 1425, instead of 1407.6, as given by Mr. Dalson in the 3d column, and add to elevations in third column $17.4 + 18 = 35.4$ to reduce to ocean level, 17.4 being the difference between Mr. Dalson's datum and the P. & E. RR. profile, and 18' upon the supposition that the P. & E. RR. levels, as shown on the profile, are 18 feet too low. (See note at foot of Table 129.) These notes apply also as well to Table 136 (a.)

TABLE 137.
WILCOX TO BUTTSVILLE.

| STATIONS. | Profile Elevation. | P. & E. RR. Datum. | Ocean. |
|---|-----------------------|-----------------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| West Stringer at north end of P. & E. RR., Wilcox Bridge, . . . | 100 | 1505.64 | 1522 |
| County line crossing, | 179.06 | 1584.70 | 1601 |
| Lanigan Run, | 208.46 | 1614.10 | 1630 |
| Shultz gas well, No. 2, | 221.— | 1627.— | 1642 |
| Clarion crossing, | 308± | 1714 | 1730 |
| Crossing Kane and Howard Hill road, | 770.50 | 2176.14 | 2192 |
| Elevation surface of creek at Kinzua crossing, | 370.58 | 1776.22 | 1792 |
| Switch in front of engine-house at Buttsville, | 570.29 | 1975.93 | 1992 |

The alignment and elevations of the Pa. and Erie RR. were obtained from Chief Engineer Henry A. St. John. In the third column of elevations above ocean, sixteen feet are added, since the levels on the P. & E. RR. are shown to be that much too low at Sunbury, Montandon, Lock Haven, &c.

This RR. is proposed as an extension of the Bradford Branch of the Erie Railway, south to Wilcox.

TABLE 138.
McKEAN AND BUFFALO RR.

| STATIONS. | Above Lake Erie. | Above Lake Erie. | Above Tide. |
|---|---------------------|---------------------|----------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Buffalo, N. Y. & P. RR., <i>Junction with the Buffalo, New York and Philadelphia RR. near Larabee's Station, on the Upper Allegheny River, (See Table 134,) . . .</i> | 873 | 904 | 1477 |
| Larabee's, | 871.50 | 902.50 | 1476 |
| Frisbee, | 860.50 | 891.50 | 1465 |
| Farmer's Valley, | 871.50 | 902.50 | 1476 |
| Smethport, | 889.06 | 920.06 | 1493 |
| Crosby, | 936.30 | 967.30 | 1540 |
| Colegrove, | 938.80 | 969.80 | 1543 |
| Hamlin, | 953 | 984 | 1557 |
| Wernwag, | 1256.50 | 1287.50 | 1861 |
| Clermont, <i>Bishop's Summit,</i> . . . | 1469.50 | 1500.50 | 2074 |

Elevations on the McKean and Buffalo RR. were furnished by Mr. S. V. Godden, Superintendent.

Datum: Lake Erie. To which must be added 573' to reduce to Ocean level.

The first column gives heights above an originally *assumed* Lake level. The second column corrects these heights for true Lake level.

VII. SOUTHERN SERIES.

TABLE 139.

WEST CHESTER AND PHILADELPHIA RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Philad'a. Depot. |
|--|--------------|--------------|-----------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Philadelphia Depot, Thirty-first and Chestnut streets, | 14 | 14 | 0 |
| Woodland street, | 57 | 57 | |
| Angora, | 74.5 | 74.5 | 3 |
| Fernwood, | 90 | 90 | |
| Darby Road, | 103 | 103 | |
| Kelleyville, | 102 | 102 | 6 |
| Clifton, | 109 | 109 | 7 |
| Springhill, | 128 | 128 | 9 |
| Morton, | 121.5 | 121.5 | 10 |
| Swarthmore, | 125 | 125 | 11 |
| Wallingford, | 168 | 168 | 13 |
| Manchester, | 211.5 | 211.5 | |
| Media, | 210 | 210 | 14 |
| Greenwood, | 218 | 218 | 16 |
| Glen Riddle, | 160 | 160 | 17 |
| Lenni, | 136 | 136 | 18 |
| Baltimore Central RR. Junction, (See Table 141,) | 133 | 133 | 19 |
| Darlington, | 143 | 143 | 20 |
| Glen Mill, | 199 | 199 | 22 |
| Cheney, | 240 | 240 | 23 |
| Street Road, | 252 | 252 | 25 |
| Hemphill, | 318 | 318 | |
| West Chester, | 406 | 406 | 27 |

The levels of the West Chester and Philadelphia R.R. were copied from the profile, by permission of Mr. Thomas H. Hall, Treasurer of the Company.

Datum: Ordinary *low* water at Philadelphia. This is about the same as Ocean level.

TABLE 140.
WEST CHESTER R.R.

| STATIONS. | Tide. | Corrected Tide. | Ocean Level. |
|--|--------------|-----------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| West Chester, <i>Gay Street</i> , | 435.07 | 413 | 420 |
| Do. <i>Market Street</i> , | 429 | 407 | 414 |
| Convent School, | 464 | 442 | 449 |
| McCall's, | 477.66 | 456 | 463 |
| Patton's, | 519.66 | 498 | 505 |
| Kirkland, | 563.16 | 541 | 548 |
| Woodland, | 596.12 | 574 | 581 |
| Summit, | 598.74 | 577 | 584 |
| Ton Road, | 591.66 | 570 | 577 |
| Hood's Road, | 600.02 | 588 | 595 |
| Malvern, <i>Junction with Pa. RR.</i> , (<i>See Table 1,</i>) | 561.53 | 539 | 546 |

The above elevations on the West Chester R.R. were furnished by Mr. Thomas H. Hall, Treasurer, November 23, 1876. They are the result of a late survey. Datum: Tide. The first column shows the elevations as furnished by Mr. Hall. The elevation of the Pa. R.R., at Malvern Station, is 539.258 above high water in the Schuylkill river, and therefore $561.53 - 539.25 = 22.27$, deducted from Mr. Hall's elevation, and $+7$ to this result should bring the heights on the West Chester R.R. approximately to Ocean level.

TABLE 141.
PHILADELPHIA AND BALTIMORE CENTRAL R.R.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Lamokin J. |
|--|--------------|--------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Lamokin Junction, (<i>Table 142,</i>) | | | 0 |
| Rockdale, | | | 3 |
| Lenni, | | | 6 |
| West Chester Junction, <i>with West Chester and Philadelphia RR.</i> , (<i>Table 139,</i>) | 133 | 133 | 7 |
| Chester Heights, | 234 | 234 | |
| Patterson, | | | 9 |
| Woodland, | 212 | 212 | |
| Concord, | 237 | 237 | 11 |
| Brandywine Summit, | 273 | 273 | 13 |
| Chadd's Ford, | 129 | 129 | 16 |
| Fairville, | 255 | 255 | 19 |

| | | | |
|---|-----|-----|----|
| Rosedale, | 312 | 312 | 20 |
| Kennett Square, | 260 | 260 | 22 |
| Toughkennamon, | 283 | 283 | 25 |
| Avondale, | 227 | 227 | 26 |
| West Grove, | 444 | 444 | 29 |
| Penn Station, | 506 | 506 | 32 |
| Elk View, | | | 33 |
| Lincoln University, | | | 35 |
| Oxford, <i>with Peach Bottom RR.,</i> (<i>See Table —,</i>) | | | 38 |
| Rising Sun, | | | |
| Rowlandville, | | | 53 |
| Columbia & P. D. Junc., <i>on the</i> <i>Susquehanna River, above</i> <i>Port Deposit, (Table 143,) .</i> | | | 57 |

Levels on the Philadelphia and Baltimore Central Railroad were copied from a profile furnished by Mr. H. Wood, General Superintendent.

Datum is said to be *mid tide* at Philadelphia—about Ocean level.

TABLE 142.

PHILADELPHIA, WILMINGTON & BALT. RR.

| STATIONS. | Profile. | Corrected Tide. | Dist. from Philada. |
|--|--------------|-----------------|---------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Philadelphia, | | | 0 |
| Southwark, | 101.40 | 7.40 | |
| Third Street, | 120.55 | 26.55 | |
| Sixth Street, | 126.78 | 32.78 | |
| Seventh Street, | 127.58 | 33.58 | |
| Tenth Street, | 126.26 | 32.26 | |
| Twelfth Street, | 120.59 | 26.59 | |
| Eighteenth Street, | 129.66 | 35.66 | |
| Grey's Ferry Bridge, | 130.59 | 36.59 | 2 |
| Bonaffon, | 153.94 | 59.94 | |
| Paschall, | 152.04 | 58.04 | |
| Darby, | 138.79 | 44.79 | |
| Sharon Hill, | 158.94 | 64.94 | |
| Moore's, | 187.95 | 93.85 | |
| Ridley Park, | 167.74 | 73.74 | |
| Chester Bridge, <i>near Chester</i> <i>Station,</i> | 118.35 | 24.33 | 14 |
| Lamokin Junc., <i>Philadelphia</i> <i>and Baltimore Central RR.,</i> (<i>Table 141,</i>) | 130.76 | 36.79 | 14 |

| | | | |
|--|--------|--------|----|
| Thurlow, | 128.24 | 34.24 | 16 |
| Linwood, | 124.88 | 30.88 | 18 |
| Claymont, | 123.50 | 29.50 | 20 |
| Holly Oak, | 103.50 | 9.50 | 21 |
| Bellevue, | 108.07 | 14.07 | 22 |
| Wilmington, (<i>Table 41</i>), | 101.11 | 7.11 | 28 |
| Delaware R.R. Junction, | 106.79 | 12.79 | 30 |
| Newport, | 114.97 | 20.97 | 32 |
| Stanton, | 111.41 | 17.41 | 34 |
| Newark, (<i>See Table 3</i>), | 200.13 | 106.13 | 40 |
| Iron Hill, | 216.70 | 122.70 | |
| Elkton, | 122.25 | 28.25 | 46 |
| North East, | 137.75 | 43.75 | 52 |
| Charlestown, | 133.18 | 39.18 | 55 |
| Perryville, <i>Port Deposit Branch</i> <i>RR.</i> , (<i>Table 143</i>), | 115.48 | 21.48 | 61 |
| Susquehanna, <i>Susquehanna</i> <i>River</i> , | 110.34 | 16.34 | |
| Havre de Grace, | 110.12 | 16.12 | 62 |
| Aberdeen, | 169.80 | 75.80 | 67 |
| Perrymansville, | 136.39 | 42.39 | 71 |
| Edgewood, | 123.53 | 29.53 | 77 |
| Magnolia, | 122.22 | 28.22 | 79 |
| Gunpowder Bridge, | 103.78 | 9.78 | |
| Chase's, | 114.40 | 20.40 | 83 |
| Stemmer's Run, | 118.50 | 24.50 | 89 |
| Bayview Junction, <i>Union RR.</i> , (<i>See Table —</i>), | 129.92 | 35.92 | 94 |
| President St., Depot, Baltimore, (<i>See Table 145</i>), | 103.33 | 9.33 | 98 |

Levels of the P., W. & B. RR. were copied from the profile in the office of the company at Philadelphia. Assumed datum 94 feet too high; 94 feet is therefore subtracted from the profile elevation for Ocean level.

Datum: Ordinary low water at Philadelphia=Ocean level.

TABLE 143.
COLUMBIA AND PORT DEPOSIT RR.

| STATIONS. | A. M. T. | Ocean Level. | Dist. from Perryville. |
|--|--------------|--------------|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Perryville, <i>Philadelphia, Wilmington and Baltimore RR., (Table 142,)</i> | | 21 | 0 |
| Port Deposit, | 8 | 9 | |
| P. & B. C. RR. Junc., <i>Junction with Baltimore Central RR., (Table 141,)</i> | 35 | 36 | |
| Conowingo Creek, | 70 | 71 | 8 |
| Bald Friar, | 77 | 78 | 9.3 |
| Ark Haven, | 79 | 80 | 11.7 |
| Peach Bottom, <i>Peach Bottom RR. starts from the opposite side of the Susquehanna River. (See Table 119,)</i> . . | 98 | 99 | 13.4 |
| Fishing Creek, | 108 | 109 | 16 4 |
| Fite's Eddy, | 118 | 119 | 17.6 |
| McCall's Ferry, | 168 | 169 | 21.8 |
| York Furnace, | 176 | 177 | 25 5 |
| Shenk's Ferry, | 182 | 183 | 27 4 |
| Safe Harbor, | 197 | 198 | 29.2 |
| Wislar's Run, | 228 | 229 | ' |
| Washington, | 231 | 232 | 37 |
| Columbia, <i>the elevation is in the lower part of Columbia. "Elevation on Pa. RR track in front of passenger station is 244'" + 7 = 251, (See Table 1,)</i> | 240 | 241 | 40 |
| Columbia Pa. RR. Depot. (See Tables 1, 44, 111,) | 250 | 251 | |

Elevations on the Columbia and Port Deposit RR. were copied from a profile furnished by Mr. J. B. Hutchinson, Chief Engineer.

Datum: Mean tide at Port Deposit, nearly=Ocean level.

Bench mark elevation 263.225, on root of Seltice tree, on the south side of the Pennsylvania RR. track, at the commencement of sharp curve in the RR. near watchman's cabin, $\frac{1}{2}$ mile east of the passenger station, and 250 (?) feet west of the 79th mile post, Columbia, Pa. This bench was established by Mr. Samuel W. Mifflin, C. E., in 1854 or 1855, and is the result of a level run from low water in the Delaware river at New Castle. A test level was run over the same line the following year, with a variation of but 4 inches from the above elevation.

TABLE 144.
WESTERN MARYLAND RR.

| STATIONS. | Ocean Level. | Dist. from Baltimore. |
|---|--------------|--------------------------|
| | <i>Fect.</i> | <i>Miles.</i> |
| Baltimore, Canton Wharf, | 20 | 0 |
| B. & P. R.R. Crossing, <i>Baltimore and Poto-</i> <i>mac R.R. (or Northern Central) Crossing,</i> <i>(See Table 109,)</i> | 150 | 1 |
| Oakland, | 380 | 5 |
| Arlington, | 420 | 6 |
| Mount Hope, | 440 | 8 |
| Howardville, | 455 | |
| Pikesville, | 435 | 10 |
| Greenwood, | 425 | 11 |
| McDonough, | | 12 |
| Junction, | 460 | 13 |
| Owing's Mills, | 480 | 14 |
| Timber Grove, | 550 | |
| Reisterstown, | 600 | 19 |
| Glen Morris, | 580 | 20 |
| Finksburg, | 375 | 22 |
| Patapsco, | 360 | 26 |
| Shamberger's, | 550 | |
| Tannery, | 610 | 30 |
| Westminster, <i>Bachman's Valley R.R., no</i> <i>levels obtainable,</i> | 700 | 33 |
| Avondale, | 540 | 36 |
| Smith's Switch, | 500 | |
| New Windsor, | 440 | 41 |
| Linwood, | 390 | 43 |
| Union Bridge, | 350 | 45 |
| Middleburg, | 415 | 48 |
| Frederick Junction, <i>Frederick Division of</i> <i>Pa. R.R., (See Table 120,)</i> | 415 | 49 |
| Double Pipe Creek, | 300 | 51 |
| Monocacy River, | 280 | |
| Rocky Ridge, | 370 | 54 |
| Loy's, | 300 | 55 |
| Graceham, | 400 | 57 |
| Mechanicstown, | 520 | 59 |
| Sabillasville, | 1120 | 66 |
| Blue Ridge Summit, <i>Monterey Springs Sum-</i> <i>mit,</i> | 1373 | 69 |
| Waynesborough, | 1200 | 71 |
| Smithsburg, | 750 | 77 |
| Chewsville, | 575 | 81 |
| Antietam Creek, | 460 | |

| | | |
|---|-----|-----|
| Cumberland Valley Junction, <i>Cumberland Valley RR.</i> , (See Table 121,) | 530 | |
| Hagerstown, | 520 | 86 |
| Williamsport, | 305 | 93 |
| Martinsburg, (See Table 145,) | | 106 |

Elevations of the W. M. RR. were copied from profile furnished through the kindness of Gen. J. M. Hood, President and General Manager of the road.

Datum: *Mean tide at Baltimore*—? Ocean level.

Additions and corrections to the above table were made by Mr. J. E. Mathews, Assistant Engineer Western Maryland RR.

BALTIMORE, *January 18, 1877.*

CHAS. ALLEN, Esq.

DEAR SIR: Mr. Hood has handed me your letter of 30th ult. to him, and I herewith send you a list of elevations at the different stations on our road. As you may notice, they differ in one or two instances from those you have already published, which may be accounted for by the fact of the stations having been moved since the other list was sent you. Westminster and Parrs Ridge should not be shown separately in the list, Westminster being at the summit of Parrs Ridge. Having formerly been connected with the Peach Bottom railroad, I take the liberty of mentioning that the elevations given of stations on that road in the column headed "Assumed Datum," (See Table 119,) are correct distances above tide, and that the difference of sixteen feet between the levels of that road and those of the Frederick Division, Pa. RR., should not be subtracted, as has been done.* If you will look at the elevations of the Columbia and Port Deposit RR., (See Table 143,) (which runs directly from tide water,) you will find the height of their grade at Peach Bottom given as ninety-eight feet. Their embankment at that point is twelve feet above the river, which, subtracted from their height of grade, gives elevation of water in river, at a point directly opposite the point given in the Peach Bottom RR. list, as eighty-six feet. Again, if you look at the list of elevations of the Frederick Division, Pa. RR., (See Table 120,) you will find the elevation of their track, at the Western Maryland RR. crossing, given as 426 feet, while, according to the levels on the Western Maryland RR., which runs directly from tide, their (the W. M.) track is only 415 feet, and besides is about 17 feet higher than the track of the Frederick Division, so, if you assume their levels to be correct, you will have to add 27 feet to each of the elevations given on our road.

Respectfully,

J. E. MATHEWS,
Assistant Engineer.

* It will be noticed, by reference to Table 119, on page N. 129, that the second column, which, in the preliminary publication of these levels, contained the wrongly applied subtraction, has been left blank.

TABLE 145.
BALTIMORE AND OHIO RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Baltimo'e. |
|--|--------------|-----------------------|-----------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Baltimore, (Camden Station,) . . | 24 | According to Gardner. | 0 |
| Mount Clare, | 66 | | |
| Mount Winans, | 34 | | |
| Relay Station, <i>Washington Branch B. & O. RR. diverges from main line at this point. (See Table —,)</i> | 66 | | 9 |
| Ellicott's Mills, | 139 | | 15 |
| Elysville, | 238 | | 20 |
| Woodstock, | 292 | | 25 |
| Marriottsville, | 305 | | 27 |
| Sykesville, | 410 | | 32 |
| Gaither's, | 434 | | |
| Woodbine, | 545 | | |
| Mount Airy, (Parrs Ridge,) . . . | 813 | | 43 |
| Monrovia, | 345 | | 50 |
| Ijamsville, | 292 | | |
| Hartman's, | 290 | | |
| Frederick Junction, <i>Frederick Branch B. & O. RR., (See Table —,)</i> | 264 | | 58 |
| Monocacy River, | 262 | | |
| Frederick City, | 280 | | |
| Doub's, | | | |
| Washington Junction, <i>Point of Rocks, Metropolitan Branch B. & O. RR. connects with main line, (See Table 146,)</i> | 229 | | 69 |
| Berlin, | 249 | | 75 |
| Knoxville, | 260 | | |
| Hagerstown Junction, <i>Washington County Branch B. & O. RR. joins main line at this point, (See Table 147,)</i> | 249 | | 80 |
| Sandy Hook, | 266 | | |
| Harper's Ferry, <i>Winchester, Potomac and Strasburg RR. connects with B. & O. RR. This is one of the railroads of the States of Virginia and West Virginia, .</i> | 272 | | 81 |
| Duffield's, | 562 | | 87 |
| Kearneysville, | 589 | | 92 |
| Vanclieveville, | 500 | | 95 |
| Martinsburg, | 435 | | 100 |

| | | |
|---|-------|-------|
| Shepardstown Road, | 467 | |
| North Mountain, | 547 | 107 |
| Cherry Run, | 398 | 113 |
| Sleepy Creek, | 410.5 | 117 |
| Hancock, | 428 | 122 |
| Sir John's Run, | 434.5 | 128 |
| Great Cacapon, | 449 | 131 |
| Willett's Run, | | 133 |
| Rockwell's Run, | 499.6 | 139 |
| Doe Gully Tunnel, | 545 | 140.5 |
| Little Cacapon, | 562 | 155 |
| South Branch Potomac River, . . | 550.5 | 161 |
| Green Spring Run, | 553 | 163 |
| Patterson's Creek, | 568 | 170 |
| North Branch Potomac River, . . | 604.5 | |
| Cumberland, <i>Pittsburg Division of</i> <i>B. & O. R.R. intersects main line</i> <i>here, (See Table 150,)</i> | 639 | 178 |
| Brady's Mill, | 642 | 185 |
| Rawlings, | 698 | 191 |
| Black Oak Bottom, | 722 | 193 |
| New Creek, | 749 | 201 |
| Piedmont, | 925 | 206 |
| Bloomington, | 1024 | 208 |
| Frankville, | 1699 | 214 |
| Swanton, | 2282 | 220 |
| Altamont, | 2620 | 223 |
| Deer Park, | 2441 | 226 |
| Oakland, | 2371 | 232 |
| Hutton's, | 2474 | 238 |
| Cranberry Summit, | 2551 | 242 |
| Rodermer's Tunnel, | 2083 | 246.5 |
| Rowlesburg, | 1392 | 253 |
| Cheat River, | 1397 | |
| Cassady Summit, | 1856 | |
| Kingwood Tunnel, | 1778 | |
| Tunnelton, | 1820 | 260 |
| Newburg, | 1215 | 267 |
| Independence, | 1156 | 268 |
| Raccoon Run, | 1227 | |
| Thornton, | 1038 | 274 |
| Grafton, <i>Parkersburg Branch B.</i> <i>& O. R.R. diverges from main</i> <i>line at this point, (See Table —,)</i> | 985 | 280 |
| Fetterman, | 984 | 281 |
| Valley Falls, | 969 | 287 |
| Texas, | 883 | 294 |
| Benton's Ferry, | 883 | 297 |

| | | | |
|---|--------|-------|-------|
| Fairmount, | 888 | | 302 |
| Barnesville, | 871 | | 303.5 |
| Barrackville, | 901 | | 306.5 |
| Farmington, | 925.53 | | 312 |
| Mannington, | 967 | | 319 |
| Glover's Gap, | 1150 | | 326 |
| Glover's Gap Tunnel, | 1146 | | |
| Burton, | 1060 | | 330 |
| Littleton, | 930 | | 337 |
| Board Tree Tunnel, | 1104 | | 340 |
| North Fork of Fish Creek, | 887 | | |
| Bellton, | | | 344 |
| Welling Tunnel, | 1193 | | |
| Cameron, | 1049 | | 351 |
| Easton's, | 967 | | 356 |
| Roseby's Rock, | 787 | | 362 |
| Moundsville, <i>Here the R.R. strikes the Ohio river bank, and ascends hence to Wheeling; crosses by a bridge at Benwood, and continues west as Central Ohio Division of B. and O. R.R., (See Table —,)</i> | 640 | | 368 |
| McMeechen's Cut, | | | 373 |
| Benwood, | 645 | | |
| South Bank of Wheeling Creek, } | | | |
| Wheeling, High Water, | 637 | (663) | 379 |

WHEELING.—Mr. J. T. Gardner, in his "Elevations of certain datum points," p. 655 of Hayden's Report of 1873, treats fully of the level of the Ohio river at Wheeling, in relation to the levels of the B. & O. R.R., and arrives at the "probable" conclusion that "the B. & O. R.R. results are too low," giving an improbable fall to the Ohio from Steubenville, exceeding one foot per mile, which is known to be its true rate of fall, from P. & S. R.R. and C. & P. R.R. surveys. High water at Wheeling is 637' by B. & O. R.R. survey of 1832, and the "channel" is 588. This is about 30' too low. Mr. Gardner makes the elevation of

Wheeling, (High Water, 1852,) about 663

Levels on the B. & O. R.R. were copied from a profile and notes in the office of the company at Baltimore, by permission of Mr. W. N. Bolling, Engineer.

Datum: The levels are based upon mid tide at Baltimore, and are according to the original survey of the road by Mr. B. H. Latrobe, Chief Engineer, many years ago. Corrections and additions to the former published list of levels on B. & O. R.R., made by Mr. Bolling, Engineer,

TABLE 146.

METROPOLITAN BRANCH B. AND O. RR.

| STATIONS. | Mid Tide. | Dist. from Washington. |
|--|--------------|------------------------|
| | <i>Feet.</i> | <i>Miles.</i> |
| Depot, Washington, D. C., | 21.5(?) | 0 |
| "I" Street, Washington, D. C., | 34 | |
| Terra Cotta, | 168 | 4 |
| Silver Spring, | 336 | 7 |
| Knowles, | 296 | 11 |
| Rockville, | 429 | 16 |
| Gaithersburg, | 516 | 22 |
| Germantown, | 422 | 27 |
| Boys, | 418 | 30 |
| Barnesville, | 500 | 33 |
| Dickersons, | 357 | 36 |
| Tuscarora, | 224 | 39 |
| Point of Rocks, <i>junction with main line B. & O. RR., (See Table 145),</i> | 229 | 43 |

The levels on the Metropolitan Branch of the Baltimore and Ohio RR. were furnished by Mr. W. N. Bolling, Engineer B. & O. RR. Datum, mid tide, Baltimore, Md.

TABLE 147.

WASHINGTON CO. BRANCH B. AND O. RR.

| STATIONS. | Mid Tide. | Dist. from Weverton. |
|---------------------------|--------------|----------------------|
| | <i>Feet.</i> | <i>Miles.</i> |
| Weverton, | 249 | 0 |
| Bartholow's, | 463 | 3 |
| Brownsville, | 535 | |
| Claggetts, | 619 | 6 |
| Beelers Summit, | 678 | 7 |
| Rhorersville, | 591 | 8 |
| Eakils Mill, | 412 | 11 |
| Keedysville, | 393 | 13 |
| Breatheds, | 472.5 | 17 |
| Hagerstown, | 527 | 24 |

The levels on the Washington County Branch of Baltimore and Ohio RR. were furnished by Mr. W. N. Bolling, Engineer B. & O. RR. Datum, mid tide, Baltimore, Md.

TABLE 148.
CUMBERLAND AND PENNSYLVANIA RR.

| STATIONS. | Above Tide. | | Dist. from Cumberland. |
|--|-------------|---------|------------------------|
| | Feet. | Feet. | Miles. |
| Cumberland, <i>Baltimore and Ohio RR.—Level of "Cumberland" in B. & O. RR., Table 145, is 639, which, however, is Mr. Latrobe's original level, (See Table 145.)</i> | 650 | | 0 |
| Eckert Branch Junction, <i>No levels,</i> | | | 2 |
| Mount Savage Junction, <i>Bridgeport & Bedford RR., (See Table 10.)</i> | | | 3 |
| C. & P. Junction, <i>B. & O. RR., Pittsburg Division, (Table 150.)</i> | | | 9 |
| Barrelville, | | | 13 |
| Mount Savage, | 1206 | | 15 |
| Frostburg, | 1920 | | 23 |
| Neff Run, | | | 29 |
| Lonacoming, | 1560 | | 32 |
| Barton, | | | 35 |
| Piedmont, <i>Rejoins the Baltimore and Ohio RR., (See Table 145.)</i> | 928 | | 40 |

Levels on the C. & P. RR. were furnished by Mr. James A. Millholland, Vice President of the Company, Cumberland, Maryland.

NOTE.—This road runs back of the mountain, west of the river, through the Cumberland Coal Basin.

TABLE 149.
CUMBERLAND TURNPIKE ROAD.

| NAMES OF TOWNS, &c. | Above Tide. | |
|---|-------------|--|
| | Feet. | |
| Cumberland, <i>(See Table 145,)</i> | 635 | |
| Frostburg. | 1890 | |
| Great Savage Mountain Summit, | 2657 | |
| Savage River, 2 miles from its head, . . . | 2376 | |
| Little Savage Mountain Summit, | 2535 | |
| Little Backbone Mountain Summit at (Beall's) Dividing Eastern and Western Waters, | 2372 | |

| | | |
|--|------|--|
| Meadow Mountain Summit, (Allegheny Mountain,) | 2654 | |
| Castleman's River, | 2077 | |
| Negro Mountain Summit, | 2826 | |
| Keyser's Ridge Summit, a spur of Negro Mountain, | 2843 | |
| Winding Ridge Summit, | 2534 | |
| Smythfield at Youghiogheny River, . . . | 1405 | |
| Barren Hill Summit, | 2450 | |
| Woodcock Hill or Briery Mountain, . . . | 2500 | |
| Laurel Hill or Most Western Mountain, . | 2412 | |
| Munroe, at Western base of Laurel Hill, . | 1065 | |
| Uniontown, | 952 | |
| Cauley's Hill, | 1274 | |
| Brownsville, at Monongahela River, . . . | 873 | |
| Hillsborough, | 1750 | |
| Washington, | 1406 | |
| West Alexandria, | 1797 | |
| Wheeling, | 748 | |

Levels on the Cumberland Turnpike Road were copied from a report made by Jonathan Knight, Chief Engineer of the Baltimore and Ohio R.R., October 5, 1835, in the office of the Company at Baltimore. They were partly taken from a map and profile made by James Schriver, in 1824. Mr. Knight says, in his report: "The levels may be sufficiently accurate for such a road, (turnpike,) yet are not so exact as levelings taken for a canal or railroad."

Datum: Probably mean tide at Baltimore.

TABLE 150.

BALTIMORE AND OHIO RR.—Pittsburg Division.

(Formerly called *Pittsburgh and Connellsville.*)

| STATIONS. | Assumed Elevation. | Mean tide. | Dist. from Cumb'land. |
|---|-----------------------|--------------|--------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Cumberland, opposite Queen City Hotel, in Cumberland. Elevation, 634.7, (See Table 145,) | 124 | 638 | 0 |
| Mt. Savage Junc., Mt. Savage Junction, Cumb. & Pa. R.R., Bedford & Bridgeport R.R., (See Tables 10, 148,) . . . | 173 | 687 | 4 |
| Mt. Savage Station, | 189 | 703 | |

| | | | |
|--|--------|--------|-----|
| Cumberland & Pa. RR. Crossing, (<i>See Table 148,</i>) | 190 | 704 | |
| Maryland State Line, | 214 | 728 | |
| Ellerslie, | 215 | 729 | |
| Cook's Mills, | 260 | 774 | 9 |
| Bridgeport, | 427 | 941 | 15 |
| Fairhope, | 866 | 1380 | 20 |
| Southampton, | 1053 | 1567 | |
| Glencoe, | 1109 | 1623 | 24 |
| Philson's, | 1306 | 1820 | 27 |
| Sandpatch Tunnel { W. Portal, | 1769 | 2283 } | 34 |
| { E. Portal, | 1721 | 2235 } | |
| Summit, | 1772 | 2286 | |
| Myersdale, Salisbury & Baltimore RR. Junction, (<i>See Table 151,</i>) | 1551 | 2065 | 37 |
| Garrett, Buffalo Valley RR., (<i>See Table 152,</i>) | 1433.5 | 1948 | 42 |
| Pinegrove, | 1360 | 1874 | 45 |
| Mineral Point, Somerset & Mineral Point RR. Junction, (<i>See Table 153,</i>) | 1310.9 | 1825 | 49 |
| Castelman, | 1242.6 | 1757 | 54 |
| Pinkerton, | 1135 | 1649 | 57 |
| Shoo-Fly Tunnel, | 1107 | 1621 | |
| Brook Tunnel, | 1044 | 1558 | 61 |
| Ursina Junction, Ursina & North Fork RR. Junction, (<i>See Table 155,</i>) | 892 | 1406 | 64 |
| Confluence, | 832 | 1346 | 66 |
| Draketown Run, | 805 | 1319 | |
| Egypt, | 788 | 1302 | 71 |
| Ohio Pyle, | 723 | 1237 | 76 |
| Indian Creek, | 476 | 990 | 81 |
| Sand Works, | 407 | 921 | |
| White Rock, Fayette and Uniontown Branch RR. Junction, (<i>See Table 156,</i>) | 393 | 907 | 90 |
| Connellsville, S. W. Pa. RR., (<i>See Table 159,</i>) | 380 | 894 | 93 |
| Broad Ford, Mt. Pleasant Branch, (<i>See Table 157,</i>) | 359 | 873 | 95 |
| Sedgwick, | 354 | 868 | |
| Dawson, Hickman Run Branch RR., (<i>See Table 158,</i>) | 350 | 864 | 98 |
| Laurel Run, | 342 | 856 | |
| Oakdale, | 335 | 849 | 101 |
| Layton, | 304 | 818 | 105 |

| | | | |
|--|-----|-----|-----|
| Banning's | 290 | 804 | 109 |
| Jacob's Creek, | 283 | 797 | 110 |
| Smithton, | 278 | 792 | 111 |
| Port Royal, | 278 | 792 | 113 |
| Snyder's, | 274 | 788 | 115 |
| West Newton, | 268 | 782 | 117 |
| Sewickley, <i>Youghiogheny RR.</i> <i>Branch of Pa. RR., difference of 1' in levels at Sewickley, (See Table 34.)</i> | 365 | 779 | 120 |
| Armstrong's Coal Mines, | 265 | 779 | 124 |
| Robbin's, | 254 | 768 | 127 |
| Coultersville, | 254 | 768 | 128 |
| Alpsville, | 254 | 768 | 129 |
| Osceola, | 254 | 768 | 130 |
| Ellrod, | 254 | 768 | 132 |
| Long Run, | 251 | 765 | 133 |
| McKeesport, | 251 | 765 | 135 |
| Riverton, | 251 | 765 | 136 |
| Saltsburg, | 251 | 765 | 138 |
| Port Perry Junction, | 251 | 765 | 139 |
| Braddock's, | 255 | 769 | 140 |
| City Farm, | 247 | 761 | 141 |
| Salt Works, | 252 | 766 | 144 |
| Brown, | 243 | 757 | |
| Grove, | 270 | 784 | |
| Hazelwood, | 275 | 789 | |
| Frankstown, | 269 | 783 | 146 |
| Laughlin, | 256 | 770 | 147 |
| Copper Works, | 249 | 763 | |
| Soho, | 255 | 769 | 148 |
| Birmingham Bridge, | 237 | 751 | |
| Pittsburgh, (<i>See Table 1</i>). . . | 237 | 751 | 150 |

Levels on B. & O. R.R., Pittsburg Division, (formerly called Pittsburg and Connellsville R.R.), were copied from the profile in the office of the Company at Connellsville, Fayette county, Pa. The table of levels (as formerly published) on the B. & O. R.R., Pittsburgh Division, was corrected by Mr. J. K. Taggart, Assistant Engineer.

Datum, as noted on the profile, is 200' below low water at Pittsburgh, and 514' above mean tide; therefore, 514' has been added to each elevation, as copied from the profile to get mean tide at Baltimore=? ocean level.

NOTE.—From Connellsville to Pittsburg this road has always been known as the "Connellsville and Pittsburgh R.R.," and is sometimes so called in the succeeding tables.

TABLE 151.
SALISBURY RR.

| STATIONS. | Mean tide. | | |
|--|--------------|--|--|
| | <i>Feet.</i> | | |
| B. & O. RR., <i>Pittsburgh Division, Junction with B. & O. RR., Pittsburgh Division, west of Meyersdale or Meyer's Mills, (See Table 150,) . .</i> | 1996 | | |
| Meyersdale, | 1964 | | |
| Coal Mines, <i>Cumberland and Elk Lick Coal Mines, . . .</i> | 1968 | | |
| Romain, | 1974 | | |
| Keystone, <i>Keystone Coal and Manufacturing Co., . . .</i> | 1976 | | |
| Livengood's Mill, | 2001 | | |
| Salisbury, | 2032 | | |
| Coal Mines, <i>Salisbury and Baltimore Coal Mines,</i> | 2232 | | |

Levels on the Salisbury RR. were furnished by Mr. R. J. Batzer, C. E. Datum: Baltimore and Ohio RR., Pittsburgh Division, at Meyersdale. This road runs south up Castleman's River, towards the Maryland line.

TABLE 152.
BUFFALO VALLEY RR.

| STATIONS. | Mean tide. | | |
|---|--------------|--|--|
| | <i>Feet.</i> | | |
| Garrett, <i>Junction with Balt. and Ohio RR., Pittsburgh Division, (See Table 150,) . .</i> | 1948 | | |
| Burkholder, | 1992 | | |
| Beaghley's, | 2010 | | |
| Bitner, | 2044 | | |
| Pine Hill, | 2064 | | |
| Hanger's, | 2073 | | |
| Berlin, | 2176 | | |

Elevations on the Buffalo Valley RR. were furnished by Mr. S. Philson, President of the Company.

Datum: B. & O. RR., Pittsburg Division.

This road runs north into Somerset county.

TABLE 153.
SOMERSET AND MINERAL PT. RR.

| STATIONS. | Assumed Elevation. | Mean tide. | |
|--|-----------------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Mineral Point, <i>Junction with Baltimore and Ohio R.R., Pittsburgh Division, (See Ta- ble 150,)</i> | 1310 | 1824 | |
| Sanner's, | 1325 | 1839 | |
| Baker's, | 1375 | 1889 | |
| Milford, | 1418 | 1932 | |
| Mud Pike, | 1502 | 2016 | |
| Roberts', | 1528 | 2042 | |
| Cantner, | 1594 | 2108 | |
| Somerset, | 1614 | 2128 | |

Levels on Somerset and Mineral Point RR. were furnished by Mr. R. J. Batzer, C. E.

Datum: Baltimore and Ohio R.R., Pittsburg Division. 514 feet has been added to each elevation as given by Mr. Batzer, to reduce the levels to mean tide at Baltimore. The road runs north in the Cox's Creek Valley, and is 8.98 miles long.

TABLE 154.
JOHNSTOWN TO SOMERSET.

| STATIONS. | Ocean Level. |
|---|--------------|
| | <i>Feet.</i> |
| Somerset, <i>Center of Patriot St., near Pleasant St., (Lo- cated line,)</i> | 2106 |
| Summit of Buffalo Creek and Stony Creek, <i>at Berlin, (Located line,)</i> | 2292 |
| Summit of Wells Creek, <i>near Somersettown, (Located line,)</i> | 2219 |
| Summit of Beaver Dam Creek, <i>Opposite Freidensburg, (Preliminary line,)</i> | 2062 |
| Mouth of Beaver Dam Creek, <i>(Located line,)</i> | 1760 |
| Turnpike, <i>at Sprucetown, near Stoystown, (Located line,)</i> | 1754 |
| Hooversville, <i>(Located line,)</i> | 1669 |
| Mouth of Shade Creek, <i>(Bench on Beach,)</i> <i>(Located line,)</i> | 1485 |
| Mouth of Paint Creek, <i>(Located line,)</i> | 1305 |
| Mouth of Ben's Creek, " | 1215 |
| Johnstown, <i>(See Table 1,)</i> | 1184 |

The above levels were furnished by Mr. David Peelor, C. E., Johnstown, Pa., and are considered by him reliable. Datum, Pa. RR. elevation at Johnstown.

TABLE 155.
URSINA AND NORTH FORK RR.

| STATIONS. | Assumed Elevations. | Mean Tide. |
|--|---------------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Ursina Junction, (<i>See Table 150,</i>) | 892 | 1406 |
| Ursina, | 828 | 1342 |
| Hexenberg, | 901 | 1415 |
| Coal Mines, <i>Pittsburgh & Baltimore Coal, Coke and Iron Co.'s Mines,</i> | 960 | 1474 |

Levels on the Ursina and North Fork RR. were furnished by Mr. R. J. Batzer, C. E. Datum, Baltimore and Ohio RR., Pittsburgh Division. 514 feet has been added to each elevation, as furnished by Mr. Batzer, to reduce the levels to mean tide at Baltimore. The road runs north, in the North Fork Creek Valley, from the point of junction with B. & O. RR., Pittsburgh Division, $\frac{1}{2}$ mile below Ursina Station, at Ursina Junction. The road is 4.5 miles in length.

TABLE 156.
FAYETTE BRANCH P. AND C. RR.

| STATIONS. | Mean Tide. | | Dist. from Connellsville. |
|--|--------------|---------|---------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Connellsville, | 894 | | 0 |
| White Rock, <i>Junction with Baltimore & Ohio RR., Pittsburgh Division, just above Connellsville, (See Table 146,)</i> | 907 | | 1 |
| Fayette, | 921 | | 2 |
| Watt's, | 991 | | 3 |
| Dunbar, | 1011 | | 4 |
| Ferguson, | 1138 | | |
| Mt. Braddock, | 1175 | | 7 |
| Summit, | 1211 | | |
| Lemont's, | 1084 | | 12 |
| Evans', | 1009 | | |
| Hoggsett's, | 978 | | |
| Uniontown, | 981 | | 14 |

Levels on this Branch of the Pittsburgh and Connellsville RR. were copied from a profile in the office of the Company at Connellsville, Pa., through the kindness of Mr. W. H. Taylor, Resident Engineer.

Datum: Mean tide at Baltimore, Md.

This road runs south-west, along the west foot of Chestnut Ridge towards the Virginia State line.

NOTE.—The other bridge (at Connellsville) carries the South-west Pennsylvania RR., (*See Table 159*), which also runs up Dunbar Creek to Dunbar, thence to Uniontown, along side of the Fayette Branch RR.

TABLE 157.

MOUNT PLEASANT BRANCH P. AND C. RR.

| STATIONS. | Mean tide. | | Dist. from Connellsville. |
|--|--------------|-----------|---------------------------|
| | <i>Feet.</i> | | <i>Miles.</i> |
| Connellsville, | 894 | | 0 |
| Broad Ford, <i> Junction with B. & O. RR., Pittsburgh Division, at Broad Ford, 2.4 miles below Connellsville, (See Table 150),</i> | 873 | | 2 |
| Morgan's, | 944 | | 3 |
| Tinstman's, | 1076 | | 5 |
| Valley Coal Mines, | 1035 | | |
| S. W. Pa. RR. Crossing, | 1040 | | |
| Fountain Mills, | 1042 | | 7 |
| West Overton, | 1045 | | 8 |
| Iron Bridge, | 1051 | | 9 |
| Stauffer's, | 1057 | | 11 |
| Mt. Pleasant, | 1086 | | 12 |
| End of Road, | 1083 | | |

Data obtained as the last mentioned.

This road runs north-east along the west foot of Chestnut Ridge.

TABLE 158.

HICKMAN'S RUN BRANCH P. AND C. RR.

| STATIONS. | Above Tide. | | |
|---|--------------|--|--|
| | <i>Feet.</i> | | |
| Dawson Junction, <i> Junction with Baltimore and Ohio RR., Pittsburgh Division, near Dawson, (See Table 150),</i> | 872 | | |
| Terminus of Road, | 1006 | | |

Data as above.

This road, 1.9 miles long, runs north to Coke Banks.

TABLE 159.

SOUTH-WEST PENNSYLVANIA EXTENSION.

| STATIONS. | Assumed Elevation. | Above Tide. | Ocean Level. |
|---|-----------------------|----------------|-----------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Connellsville, <i>Crosses above B. & O. R.R. Pittsburg Division, here on a bridge, (See Table 150,)</i> | 159.5 | 908 | 915 |
| Sub-grade, Pier No. 1, | 153.6 | 902 | 909 |
| Ordinary Water in <i>Youghiogheny River, at R.R., Bridge, S. W. Penna. R.R.</i> | 118 | 866 | 873 |
| New Haven, | 138 | 886 | 893 |
| Wheelerville, | 144 | 892 | 899 |
| Dunbar, | 246.4 | 995 | 1002 |
| Ferguson, | 376.2 | 1125 | 1132 |
| Mt. Braddock, <i>Deep Cut; original surface 485 + 748.5 = 1233.5</i> | 448 | 1196 | 1203 |
| Lemont, | 274.8 | 1023 | 1030 |
| Hoggsett's Mill, | 205.7 | 954 | 961 |
| Uniontown, <i>Intersection of Main Street and Broadway,</i> | 234.2 | 983 | 990 |

Levels on the Extension of Southwest Penna. R.R. were furnished by Mr. John C. Oliphant, Engineer.

Datum is *high tide* in Schuylkill River, at Philadelphia. Add 7' for ocean level. For the surveys an artificial datum was assumed, as shown in column 1. Column 2 gives this corrected for high tide at Philadelphia. Column 3 corrected for ocean level.

The main road is given in the I series, Table 33.

This road crosses the Youghiogheny at Connellsville, and keeps up Dunbar Creek over to Uniontown, parallel with the Fayette County Branch of the B. & O. R.R., Pittsburg Division. See Table 156.

TABLE 160.

YOUGHIOGHENY COAL MINE LEVELS.

| | | |
|---|----|--------------|
| | | <i>Feet.</i> |
| Youghiogheny Mine, No. 1, | 2, | 760 |
| Do. | 2, | 776.40 |
| Do. | 4, | 800.40 |
| Th. Moore's drift at Moore's Station, P. & C. R.R., | | 793.40 |
| Markel's drift, at Junction of Youghiogheny R.R., | | 824.44 |

Elevations of *Coal openings* on the line of Youghiogheny R.R., furnished by Mr. J. F. Wolf, Engineer Penn Gas Coal Company.

Datum: That of the Pa. R.R.

TABLE 161.

WESTMORELAND COUNTY LEVELS.

| | <i>Feet.</i> |
|---|--------------|
| Long Run Presbyterian Church, <i>bench mark on door sill,</i> | +1155 |
| Circleville Intersection of Mount Pleasant Turnpike with Greensburg and Pittsburg Turnpike, <i>bench mark on locust tree,</i> | 1225 |
| Jacksonville. <i>Turnpike east end of town,</i> | 1152 |
| South Side Mine Mouth Coal, | 898 |
| Larimer's Coal Mine, | 961 |
| Ray's Coal Bank; <i>on farm of William Ray's heirs,</i> | 1052 |
| Robinson's Coal Bank; <i>on farm of R. S. Robinson,</i> | 989 |
| Bigley's Mines; <i>mouth of drain, entry from Armstrong's Osceola Works, P. & C. RR., at head of Bigley's main entry,</i> | 902 |
| Coal Hollow: <i>Youghiogheny Coal Hollow Coal Company's Mines, between Guffey's and Shaner's Station, P. & C. RR. Coal,</i> | 789 |
| Armstrong's Coal, <i>opposite Buena Vista, (east,)</i> | 813 |
| Moore's Coal Mine, <i>on B. & O. RR., Pittsburgh Division,</i> | 812 |
| Suter's Station, <i>B. & O. RR., Pittsburgh Division. Coal,</i> | 843 |
| Westmoreland Coal Shaft, <i>Pa. RR.,</i> | 751 |
| Foster Slope, <i>(Penn Township,) Pa. RR. Coal,</i> | 935 |
| Penn Coal Mine, <i>north side of Penn Station, Pa. RR.,</i> | 927 |
| Kifer's Coal Bank, <i>east of Penn Station, north side of Pa. RR.,</i> | 1140 |
| Smith's Coal Bank, | 1180 |
| Loughner's Coal Bank, | 1102 |
| Harrison City, <i>two miles north of Manor Station, on Pa. RR., on bridge over Brushy Run,</i> | 967 |
| Cross-Roads, <i>two miles west of Harrison City,</i> | 1185 |
| Salem: <i>Intersection of Freeport and Saltzburg roads, north-east of Salem,</i> | 1231 |
| Salem: <i>Burnt Cabin Summit, between Allegheny and Mo- nongahela waters, between Beaver Run and Turtle Creek, one-half mile north-east of Salem,</i> | 1200 |
| Salem Cross-Roads, <i>(Delmont P. O.,)</i> | 1255 |
| Salem: <i>Coal at Salem Cross-Roads,</i> | 1272 |
| Bouquet Village, <i>Road opposite Grist Mill,</i> | 1102 |
| Bouquet Coal, | 1104 |
| William Duff's Steam Grist Mill, <i>surface of water just below mill,</i> | 950 |
| King's Bank, <i>Coal at Burnt Cabin Summit,</i> | 1203 |
| McQuade's Coal Bank, <i>on road leading from Salem Cross- Roads to Freeport,</i> | 1189 |
| John Cochran's Coal Bank, | 1132 |
| Thorn Run: <i>Water in run at road crossing James Coch- ran's farm,</i> | 1080 |
| Turtle Creek: <i>Water in Creek at northern turnpike cross- ing, on Waugaman's farm,</i> | 1051 |

| | |
|---|------|
| Turtle Creek : <i>Northern turnpike crossing at Long's,</i> | 995 |
| Turtle Creek : <i>Water in creek at Remaly's Mill,</i> | 950 |
| Walton's Summit, <i>between waters of Turtle creek and</i> <i>Brushy run,</i> | 1194 |
| Longacre's Summit, | 1187 |
| Brinker's Summit, | 1202 |
| Fink's Run: <i>Water at junction with Brushy run, four</i> <i>miles north of Manor Station, Pa. RR.,</i> | 1000 |

Various datum points in Westmoreland county, Pennsylvania, from a survey made by Mr. F. Z. Schellenberg, Superintendent of the Westmoreland Coal Company, Irwin's Station, Penna. RR. are given in the above tables.

Datum: That of the Pennsylvania RR. To all the above figures must be added 7' to make the elevation above Ocean Level.

TABLE 162.

PITTSBURGH, VIRGINIA AND CHARLESTON RR.

| STATIONS. | Above Tide. | Ocean Level. | Dist. from Pittsb'g. |
|---|----------------|-----------------|-------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Pittsburg, <i>Junction with the Pitts-</i> <i>burg, Cincinnati and St. Louis</i> <i>RR., (See Table 180.)</i> | 750 | 766 | 0 |
| Twelfth street, Birmingham, | 786 | 802 | 1 |
| Eighteenth street, " | 779 | 795 | |
| Twenty-second street " | 770 | 786 | |
| Thirtieth street, " | 745 | 761 | |
| Beek's Run, | 750 | 766 | |
| Bird's Run, | 749 | 765 | |
| Street's Run, | 745 | 761 | |
| West's Run, | 740 | 756 | |
| Homestead, | 745 | 761 | 8 |
| Patterson's Run, | 742 | 758 | |
| Opposite Braddock's, | 730 | 746 | |
| Thompson's, | 749 | 765 | 11 |
| Opposite McKeesport, | 725 | 741 | 15 |
| Curry's Run, <i>on bridge,</i> | 734 | 750 | |
| Camden, | 738 | 754 | 17 |
| Rock Run, | 731 | 747 | |
| Pine Run, | 739 | 755 | |
| Peter's Creek, | 735 | 751 | |
| Wylie's, | 743 | 759 | |
| Elizabeth, | 731 | 747 | 22 |
| Walton's Coal Road Crossing, | 741 | 757 | |
| Hodgen's Coal Road, | 735 | 751 | |
| Coal Bluff Road, | 735 | 751 | |

| | | | |
|---|-----|-----|----|
| Houston's Run, | 740 | 756 | 31 |
| Buffalo Coal Works, | 748 | 764 | |
| Mingo Creek, | 740 | 756 | |
| Dry Run, | 735 | 751 | |
| Monongahela City, | 737 | 753 | |
| Pigeon Creek, <i>Surface of water at ordinary stage</i> $709 + 16 = 725$ above Ocean, | 735 | 751 | |
| Johnson's Coal Road, | 750 | 766 | |
| Pike Run, | 719 | 735 | |
| West Brownsville, <i>In street in front of hotel,</i> | 758 | 774 | |

Levels on the P. V. & C. RR. were copied from the profile in the office of the company at Pittsburgh, by permission of J. M. Byers, Esq., Superintendent.

Datum: Pa. RR. levels.

According to corrections by Mr. J. M. Byers, Chief Engineer and Superintendent, the levels on the P., V. & C. RR. are made to agree with the levels on P. C. & St. Louis RR., by adding 9' for high tide at Philadelphia and 7' for Ocean level.

This road ascends the west bank of the Monongahela river from Pittsburgh to the Virginia State Line, and is in process of completion above Monongahela City. It crosses the river from Pittsburgh to Birmingham on a high bridge.

TABLE 163.
PITTSBURGH.

Elevation of Points in City of Pittsburgh, Pa.

| BENCH MARKS. | City Datum. | Ocean Level. |
|--|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| On window-sill of Monongahela Incline Plane, Check House, . . . | 407.075 | 1106.275 |
| On Belt-course of Union Depot, main entrance, | 47.203 | 746.403 |
| On east end door-sill of Point Breeze Hotel, at intersection of Penn and Fifth Avenue, | 273.814 | 973.014 |
| On Belt-course of Munshall's Distillery, corner Penn Avenue and Water street, | 28.198 | 727.398 |
| On door-sill of Post Office, | 51.554 | 750.754 |
| On embankment of <i>Lower</i> (old) Reservoir, on Bedford Avenue, . | 165.854 | 865.044 |

| | | | |
|---|---------|----------|--|
| On embankment of <i>Upper</i> (old) Reservoir, Bedford Avenue, . . . | 401.674 | 1100.874 | |
| On flow line of Highland Avenue (new) Reservoir, | 365 | 1064.20 | |
| On flow line of Herron Hill (new) Reservoir, | 560 | 1259.20 | |
| On flow line of Brilliant Hill (new) Reservoir, | 235 | 934.20 | |

Elevations at different points in the city of Pittsburgh, Pa., were furnished by Mr. William Martin, Assistant Engineer.

Datum: *Low water in the Allegheny river* at the Suspension Bridge, which, according to Mr. James T. Gardner's determination, is 699.20' above the mean surface of the Atlantic Ocean. See page 655, vol. I, Hayden's Geological Survey Report of 1873.

TABLE 164.
ALLEGHENY VALLEY RR.

| STATIONS. | Profile Elevations. | Above Ocean. | Dist. from Pittsburg. |
|---|------------------------|-----------------|--------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Pittsburgh-Union Depot, B. M., . . | 745.26 | 745.26 | 0 |
| B. M., on outer cor. of Coping, near 26th St., | | 745.5 | |
| Pittsburgh, <i>Liberty Av. Crossing</i> , | | 743.5 | 1 |
| Opposite Mile Post, | | 733.8 | 2 |
| B. M., on S. Wall, upper outside cor. Culvert, | | 727.9 | |
| Opp. 43d St. Station, | | 731.9 | 2.6 |
| Crossing of 50th St., | 737.7 | 738.9 | |
| Opp. McCandless, | | 740.4 | 3.4 |
| Do. Mile Post, | 742.1 | 743.0 | 4.0 |
| Do. Sharpsburg Sta., | | 744.9 | 4.4 |
| B. M., left of entrance Sharpsburg Bridge, on top of Coping, | | 741.2 | |
| Opp. Mile Post, Morning Side Sta., | 746.5 | 747.2 | 5.0 |
| B. M., on N. Abut., upper outside cor. Bridge No. 6, | | 746.1 | |
| Opp. Mile Post and Brilliant Sta., | 746.7 | 747.4 | 6.0 |
| Do. do. | 745.1 | 746.4 | 7.0 |
| Do. Coleman Sta., | | 746.1 | |
| Do. Wildwood Sta., | | 746.5 | 7.7 |
| Do. Mile Post, | | 747.0 | 8.0 |
| B. M., on S. Abut., upper inside corner of Sandy Creek Bridge, | | 745.4 | |

| | | | |
|--|-------|-------|------|
| Opp. Sandy Creek Sta., | | 746.3 | 8.8 |
| Do. Mile Post, | | 746.7 | 9.0 |
| Do. Armstrong Sta., | | 746 | 9.3 |
| Do. Iona Sta., | | 745.6 | 9.9 |
| Do. Mile Post, | 745.2 | 745.9 | 10.0 |
| Do. Verona Sta., | 745.2 | 745.8 | 10.3 |
| B. M., on Stone Water Table of Round House, left of entrance, | | 746.8 | |
| B. M., on S. Abutment, upper in- side corner Verona Bridge, | | 750.1 | |
| Opp. Mile Post, | 755.7 | 757.7 | 11.0 |
| Do. Edgewater Sta., | | 760.9 | 11.2 |
| Do. Hulton Sta., | | 777.9 | 11.8 |
| Opp. Mile Post, | 778.2 | 779.0 | 12.0 |
| Do. do. | | 771.8 | 13.0 |
| Do. do. | | 762.2 | 14.0 |
| Do. do. | | 759.5 | 15.0 |
| Opp. Johnson Sta., | 759.4 | 760.0 | 15.1 |
| Do. Mile Post, | | 756.0 | 16.0 |
| Do. Logan's Ferry Sta., | 755.1 | 756.7 | 16.5 |
| Do. Mile Post, | | 756.1 | 17.0 |
| B. M., on upper inside corner of South Abutment, Pochatoe Br., | | 755.0 | |
| Opp. Parnassus Sta., | 762.0 | 763.4 | 17.4 |
| Do. Mile Post, | | 774.4 | 18.0 |
| B. M., on upper inside corner of South Wall of Culvert, | | 791.3 | |
| Opp. Arnold's Sta. and Mile Post, | 792.1 | 793.5 | 19.0 |
| Do. Camp Ground Sta., | | 789.0 | |
| B. M., on upper inside corner of S. Abutment, Bridge No. 19½, | | 787.2 | |
| Opp. Mile Post, | | 785.2 | 20.0 |
| B. M., on upper inside corner of S. Abutment of Bridge No. 20, | | 776.9 | |
| Opp. Tarentum Sta., | 777.1 | 778.0 | 20.7 |
| Do. Mile Post, | 770.2 | 773.4 | 21.0 |
| Do. do. | | 766.6 | 22.0 |
| B. M., on upper inside corner of S. Abutment, Bridge No. 22, | | 764.8 | |
| Opp. Chartiers Sta., | | 764.9 | 22.2 |
| Do. Soda Works Sta., | | 760.8 | 22.9 |
| Do. Mile Post, | | 761.7 | 23.0 |
| Do. do. | | 772.3 | 24.0 |
| Do. do. | | 775.0 | 25.0 |
| B. M., on lower inside corner of N. Wall of Culvert, | | 774.0 | |
| B. M., on upper inside corner of South Abutment of Bridge No. 25, | | 777.6 | |

| | | | |
|---|--------|--------|------|
| Opp. Mile Post, | | 780.5 | 26.0 |
| Do. do. | | 786.9 | 27.0 |
| Do. Garver's Ferry Sta., | | 785.1 | 27.2 |
| Do. Mile Post, | | 782.6 | 28.0 |
| B. M., on <i>White Oak</i> , near <i>West Penn Junction</i> , | 782.72 | 783.44 | |
| Crossing of <i>River Rail of A. V. R.R.</i> , and <i>South Rail of West Penn R.R.</i> , (<i>See Tables 27, 28</i>), | 789.85 | 790.64 | 28.8 |
| B. M., on <i>N. W. inside corner of N. Abut. of Kiskiminetis Bridge</i> , | 793.21 | 794.00 | |
| Opp. Mile Post, | | 795.0 | 29.0 |
| B. M., on <i>lower inside corner of North Wall of Culvert</i> , | | 795.3 | |
| Opp. <i>Aladdin Sta.</i> , | | 792.9 | 30.0 |
| Do. Mile Post, | | 786.0 | 31.0 |
| Do. do. | | 779.6 | 32.0 |
| B. M., on <i>upper inside corner of S. Abutment of Bridge No. 32</i> , | | 779.8 | |
| Opp. Mile Post, | 782.7 | 784.3 | 33.0 |
| B. M., on <i>lower inside corner of North Wall of Culvert</i> , | | 781.7 | |
| Opp. <i>White Rock Sta.</i> , | 780.6 | 782.4 | 33.4 |
| Do. Mile Post, | 778.1 | 780.4 | 34.0 |
| B. M., on <i>lower inside corner of North Wall of Culvert</i> , | | 778.0 | |
| Opp. <i>Kelly Sta.</i> , | 778.6 | 780.6 | 34.6 |
| Do. Mile Post, | 779.5 | 781.3 | 35.0 |
| B. M., on " <i>Hickory Right</i> ," <i>315 ft. North of 35th Mile Post</i> , | 793.35 | 794.52 | |
| Opp. Mile Post, | | 784.3 | 36.0 |
| B. M., on <i>lower inside corner of North Wall of Culvert</i> , | | 782.7 | |
| Opp. <i>Logansport Sta.</i> , | | 785 | 36.8 |
| Do. Mile Post, | 785.1 | 785.5 | 37.0 |
| Do. do. | | 787.9 | 38.0 |
| B. M., on <i>upper inside corner of South Abutment Bridge No. 38</i> , | | 789.0 | |
| Opp. Mile Post, | | 788.5 | 39.0 |
| Do. <i>Roston Sta.</i> , | 786.9 | 788.4 | 39.2 |
| Do. Mile Post, | | 782.5 | 40.0 |
| Do. do. | 787.6 | 789.8 | 41.0 |
| Do. do. | 797.7 | 797.6 | 42.0 |
| Do. <i>Manorville Sta.</i> , | 796.4 | 797.9 | 42.3 |
| B. M., on <i>outside corner of S. Wall of Culvert No. 42</i> , | | 794.4 | |
| Opp. Mile Post, | | 804.7 | 43.0 |
| B. M. on <i>upper inside corner of S. Abutment of Bridge No. 43½</i> , | | 810.9 | |

| | | | |
|---|--------|--------|------|
| Opp. Mile Post, | | | 44.0 |
| B. M., Kittanning, <i>Top of curbstone on street corner in front of Valley Central Hotel,</i> | 809.02 | 809.94 | 44.1 |
| Kittanning, same B. M. assumed. | | | |
| <i>From Kittanning to South Oil City the levels were not re-run, and the elevations in the 1st column are above an assumed datum, which was 500 ft. below the Kittanning B. M. As the new levels raise this B. M. 0.92 ft., all the elevations in the 2d column, between Kittanning and South Oil City, have been raised to correspond with this correction by adding 309.9 ft. instead of 309.0 ft. to reduce them to ocean level, .</i> | 500 | | |
| Inside cor. of N. W. end of Abutment, | 494.1 | 804.0 | 46.0 |
| S. E. cor. of Coping of Bridge Abut., | 497.9 | 807.8 | 47.4 |
| Opp. Cowanshannock Sta., | 498.8 | 808.7 | 47.7 |
| S. W. Cor of Bridge Abutment., | 498.8 | 808.7 | 48.9 |
| Opp. Pine Creek Sta., | 502.2 | 812.1 | 49.5 |
| N. W. outside cor. Pine Creek Bridge Abut., | 502.2 | 812.1 | 49.6 |
| S. W. cor. of Water Sta. Platform, | 512.5 | 822.4 | 52.1 |
| S. W. cor. of Bridge Abutment, | 511.7 | 821.6 | 53.3 |
| Opp. Templeton Staa., | 513.9 | 823.8 | 53.8 |
| N. Abutment, Mahoning Bridge, | 513.5 | 823.4 | |
| Opp. Mahoning St., | 514.4 | 824.3 | 54.7 |
| N. Bridge Seat, upper outside cor. | 514.4 | 824.3 | 55.4 |
| S. W. corner of Coping, | 513.6 | 823.5 | 55.8 |
| N. Abutment, lower outside corner, | 516.3 | 826.2 | 56.7 |
| N. do. upper inside do. | 519.7 | 829.6 | 58.2 |
| S. Abutment, lower outside corner, | 522.5 | 832.4 | 59.2 |
| Opp. Reimerton Station, | 526.8 | 836.7 | 59.4 |
| N. Abutment, lower inside corner, | 521.6 | 831.5 | 59.7 |
| S. Bridge seat, do. do. | 526.7 | 836.6 | 60.0 |
| S. Abutment, lower outside corner, | 530.5 | 840.4 | 62.2 |
| S. Abutment Red Bank Bridge, inside corner, | 539.7 | 849.6 | 63.0 |
| N. Abutment Red Bank Bridge, lower end, | 539.7 | 849.6 | 63.1 |
| Top of rail on Red Bank Bridge, | 540.4 | 850.3 | |
| Red Bank Junction, (<i>See Table 165,</i>) | 540.9 | 850.8 | 63.7 |
| N. Abutment, upper inside corner, | 544.5 | 854.4 | 64.5 |
| Do. do. outside corner, | 541.4 | 851.3 | 65.3 |

| | | | |
|---|-------|-------|-------|
| N. Abutment, upper outside corner, | 542.0 | 851.9 | 65.7 |
| Opp. Phillipsburg Station, . . . | 545.3 | 855.2 | 65.9 |
| N. Abutment, lower outside corner, | 542.0 | 851.9 | 66.4 |
| Do. do. do. | 542.6 | 852.5 | 67.0 |
| N. Abutment, upper inside corner, . | 544.1 | 854.0 | 68.0 |
| Do. do. do. | 543.9 | 853.8 | 68.4 |
| Opp. Brady's Bend Station, . . . | 546.4 | 856.5 | 68.5 |
| Catfish Station, door sill Tel. office, | | | |
| S. side, | 549.3 | 859.2 | 71.0 |
| S. Abutment, upper outside corner, | 547.6 | 857.5 | 71.4 |
| N. Abutment, lower inside corner, . | 548.4 | 858.3 | 71.9 |
| Opp. Sarah Furnace Station, . . . | 551.5 | 861.4 | 72.0 |
| S. Abutment, lower end, . . . | 551.7 | 861.6 | 73.0 |
| Do. upper inside corner, . | 555.6 | 865.5 | 74.4 |
| Hillville Station, | 555.3 | 865.2 | |
| N. Abutment, lower outside corner, | 560.3 | 870.2 | 75.9 |
| Do. do. do. | 555.4 | 865.3 | 76.5 |
| Do. do. do. | 565.0 | 874.9 | 77.7 |
| Opp. Monterey Station, | 564.7 | 874.6 | 78.1 |
| N. Abutment, lower inside corner, . | 564.3 | 874.2 | 78.9 |
| Do. do. do. | 570.0 | 879.9 | 80.3 |
| S. Abutment, lower outside corner, | 572.0 | 881.9 | 81.5 |
| Opp. Bear Creek Station, | | | 82.0 |
| Top of coping south of entrance to Parker City Bridge, (<i>See Table</i> <i>170,</i>) | 578.2 | 888.1 | |
| Opp. Parker Station, | 579.2 | 889.1 | 82.5 |
| Top of coping upper end of S. Abut., | 579.3 | 889.2 | 83.6 |
| Opp. Foxburg Station, | 587.0 | 896.9 | 85.2 |
| Opp. Fullerton Station, | | | 86.7 |
| N. Abutment, upper inside corner, . | 589.6 | 899.5 | 87.5 |
| S. Abutment, lower outside corner, | 590.7 | 900.6 | 88.5 |
| S. Abutment, lower inside corner, . | 589.0 | 898.9 | 88.8 |
| Opp. Emlenton Station, | 595.2 | 905.1 | 89.0 |
| Opp. Dotter's Station, | 604.9 | 914.8 | 91.8 |
| S. Abutment, upper end, | 601.5 | 911.4 | 92.1 |
| N. Abutment, upper inside corner, . | 602.4 | 912.3 | 93.4 |
| N. Abutment, lower inside corner, | 608.0 | 917.9 | 94.4 |
| N. Abutment, upper outside corner, | 609.5 | 919.4 | 95.6 |
| Opp. Black's Station, | 612.6 | 922.5 | 96.7 |
| Top of coping, upper end S. corner, | 607.7 | 917.6 | 97.0 |
| Opp. Rockland Station, | 616.6 | 926.5 | 98.6 |
| Top of coping, upper end N. corner, | 614.3 | 924.2 | 98.7 |
| Do. do. do. S. do. | 613.8 | 923.7 | 99.4 |
| Opp. St. George Station, | 624.9 | 934.8 | 101.4 |
| Top of coping, lower end N. corner, | 619.3 | 929.2 | 102.9 |
| Opp. Roberts' Run Station, | | | 103.8 |
| Water Station platform, S. E. corner, | 631.3 | 941.4 | 104.0 |

| | | | |
|--|--------|---------|-------|
| Top of coping, lower end N. corner, | 625.6 | 935.5 | 104.8 |
| Opp. Scrubgrass Station, | 634.6 | 944.5 | 106.7 |
| Opp. Burning Well Station, <i>corner of coping, lower end, N. side of arch culvert, above Burning Well Station,</i> | 634.8 | 944.7 | 108.9 |
| Opp. Brandon's Station, | 651.4 | 961.3 | 112.7 |
| Opp. Foster's Station, | 659.8 | 969.7 | 115.5 |
| Opp. East Sandy Station, | 665.4 | 975.3 | 117.8 |
| S. Abutment, lower inside cor. East Sandy Br., | 665.2 | 975.1 | |
| N. Abutment, lower inside corner, | 665.6 | 975.5 | 118.7 |
| Do. do. do. | 670.8 | 980.7 | 121.1 |
| Opp. Cochran Station, | 672.3 | 982.2 | 121.2 |
| Opp. Franklin, <i>the A. V. RR. Depot at Franklin is 25.33 ft. below the L. S. & M. S. Depot, which is on the opposite side of the river, and 0.49 ft. below the A. & G. W. RR. Depot,</i> | 678.5 | 988.4 | 123.1 |
| End of Long cut, | 682.3 | 992.2 | 124.5 |
| Opp. Prentice Station, | | | 125.6 |
| Opp. mile post, | 686.4 | 996.3 | 126.0 |
| Opp. Reno Station, | | | 127.0 |
| N. Abut., lower end, inside corner Bridge seat, | 691.7 | 1001.6 | 128.8 |
| Opp. mile post, | 696.7 | 1006.6 | 130.0 |
| Opp. South Oil City Station, | 699.2 | 1009.27 | 131.0 |
| <i>Top of coping left of entrance to Allegheny River Bridge, (outside corner,)</i> | 706.31 | 1016.25 | 131.2 |
| Junction with Pittsburg, Titusville & Buffalo RR., (<i>See Tables 171, 172,</i>) | | 1010.55 | 131.4 |
| Oil City, <i>Union Depot,</i> | | | 132.0 |
| Top of 4th rail from platform <i>opposite center of passenger house,</i> | | 1008.82 | |

Levels on Allegheny Valley RR. were furnished for this report by Mr. John F. Carll.

Where not otherwise specified, the elevations given are for the top of the river rail of main track. Where the track is double, it is the same rail of the river track.

This road is considered as running north and south.

The elevations given in the first column were copied from the profile of the RR., in the office at Pittsburg, by permission of Mr. H. Blackstone, Chief Engineer. Those in the second column, from Pittsburg to Kittan-

ning, are the results of the levels run for the Geological Survey of Pennsylvania, by John H. Carl and Arthur Hall, in February, 1877.

All bench marks not represented in the first column are new ones, put in by the last named parties, and are marked **X**.

Datum: Pa. R.R., at Pittsburgh.

TABLE 165.

BENNETT'S BRANCH EXTENSION R.R.

(A. From A. V. R.R. Profile.)

| STATIONS. | Profile. | Above Tide. | Ocean Level. |
|--|--------------|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Driftwood Junction, <i>With P. & E. RR. near Driftwood. "795" on P. & E. profile, (See Table 129,)</i> | 788 | 795 | 814 |
| Mix Run, | 848 | 855 | 874 |
| Miller's, | 880 | 887 | 906 |
| Dent's Run, | 898 | 905 | 924 |
| Enz, | 938 | 945 | 964 |
| Grant, | 949 | 956 | 995 |
| Mount Pleasant, | 973 | 980 | 999 |
| Devil's Blbow, | 993 | 1000 | 1019 |
| Benezette, | 1014 | 1021 | 1040 |
| Meadie's Run, <i>Bench mark on bridge; west abutment, top of cap-stone, N. E. corner,</i> | 1073 | 1080 | 1099 |
| Caledonia Tunnel, <i>250' east of Tunnel,</i> | 1122 | 1129 | 1148 |
| Slabtown Dam, | 1163 | 1170 | 1189 |
| Hebner's Run, | 1245 | 1252 | 1271 |
| Clear Run, | 1385 | 1392 | 1411 |
| Slab Run, | 1381 | 1388 | 1407 |
| Fall's Creek, | 1381 | 1388 | 1407 |
| Crooked Run, | 1378 | 1385 | 1404 |
| Evergreen, | 1374 | 1381 | 1400 |
| Maghee's, | 1361 | 1368 | 1387 |
| Panther's Run, <i>cap-stone of east abutment,</i> | 1362 | 1369 | 1388 |
| Reynoldsville, | 1351 | 1358 | 1377 |
| Prior Run, <i>cap-stone of east abutment,</i> | 1342 | 1349 | 1368 |
| Prindible's, | 1335 | 1342 | 1361 |
| McAnnutt Run, | 1335 | 1342 | 1361 |
| Camp Run, | 1317 | 1324 | 1343 |
| Fuller's Mill, | 1301 | 1308 | 1327 |

| | | | |
|--|------|------|------|
| Wolf Run, | 1295 | 1302 | 1321 |
| Cable Run, | 1285 | 1292 | 1311 |
| Iowa Mill, | 1273 | 1280 | 1299 |
| Gooseneck, | 1256 | 1263 | 1282 |
| Bell's Mill, | 1340 | 1347 | 1366 |
| Garrison's Mill, | 1235 | 1242 | 1261 |
| Brookville, | 1209 | 1216 | 1235 |
| Nicholson's Mill, | 1199 | 1206 | 1225 |
| Corder's Run, | 1200 | 1207 | 1226 |
| Puckerty Point, | 1189 | 1196 | 1215 |
| Rattlesnake Run, | 1183 | 1190 | 1209 |
| Baxter's Mill, | 1181 | 1188 | 1207 |
| Heathville, | 1137 | 1144 | 1163 |
| Motter's Run, | 1124 | 1231 | 1250 |
| Bear Tree Run, | 1107 | 1114 | 1133 |
| Maysville, | 1082 | 1089 | 1108 |
| Pine Run, | 1075 | 1082 | 1101 |
| Millville, | 1067 | 1074 | 1093 |
| Indiantown Run, | 1063 | 1070 | 1089 |
| Middle Run, | 1060 | 1067 | 1086 |
| New Bethlehem, | 1054 | 1061 | 1080 |
| Anthony's Neck, | 1025 | 1032 | 1051 |
| Leatherwood, | 1001 | 1008 | 1027 |
| Rock Run, | 940 | 947 | 966 |
| Buck Lick Run, | 913 | 920 | 939 |
| Lawsonham, | 893 | 900 | 919 |
| Fiddler's Run, | 889 | 896 | 915 |
| Red Bank Junction, (See Table 164,) | 825 | 832 | 851 |

Levels on Bennett's Branch Extension, A. V. R.R., were copied from the profile in the office of the A. V. R.R., at Pittsburgh, Pa., through kindness of Mr. H. Blackstone, Chief Engineer.

Datum: Tide water, Philadelphia. According to elevations on Allegheny Valley R.R., at Red Bank Junction, (See Table 164,) as determined by J. F. Carll, February, 1877, 850.8 above Ocean, therefore 18.8 feet have been added to the second column to reduce the third column to Ocean level.

*TABLE 166.

BENNETT'S BRANCH RR.*(B. From J. A. Wilson, C. E.)*

| LOCALITY OF STATIONS, BENCH MARKS, &C. | Elevation per Profile. | Eleva. Top of Rail. | Ocean Level. | Dista'ce from Drift'd Junc. |
|---|---------------------------|------------------------------|-----------------|--------------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Driftwood Junction, <i>with P. & E. RR., (See Table 129,)</i> | 788 | 790 | 813.8 | 0 |
| Mix Run, | 850 | 852 | 875.8 | |
| Miller's Station, | 879 | 881 | 904.8 | 7 |
| Dent's Run Station, | 900 | 902 | 925.8 | 9 |
| Enz Station, | 938 | 940 | 963.8 | |
| Grant Station, | 949 | 951 | 974.8 | 12 |
| Mount Pleasant, | 973 | 975 | 998.8 | |
| Benezette, | 1014 | 1016 | 1039.8 | 17 |
| Meadie's Run Bridge, <i>bench mark top of cap-stone, N. E. corner west abutment, .</i> | 1073 | | 1096.8 | |
| Caledonia Tunnel, <i>east end of tunnel,</i> | 1122 | 1124 | 1147.8 | |
| Laurel Hill Bridge, <i>bench top of cap-stone, N. E. corner west abutment, .</i> | 1127 | | 1160.8 | |
| Weedville Bridge, <i>bench top of cap-stone, N. E. corner west abutment,</i> | 1152 | | 1175.8 | |
| Tyler's Station, | 1206 | 1208 | 1231.8 | 29 |
| Hebner's Run Trestle, | 1245 | 1247 | 1270.8 | |
| Pennfield Station, | 1263 | 1265 | 1288.8 | 33 |
| Bundy's Trestle, | 1291 | 1293 | 1316.8 | |
| South Fork Trestle, <i>level given at east end, now called Winterburn,</i> | 1322 | 1324 | 1347.8 | |
| Summit Tunnel, <i>east end, .</i> | 1440 | 1442 | 1465.8 | 39? |
| Do. <i>west end, .</i> | 1437 | 1439 | 1462.8 | |
| Do. <i>top of hill over tunnel, on center line of road; length of tunnel 1950 feet,</i> | 1654 | | 1677.8 | |
| Shaeffer's, | 1399 | 1401 | 1424.8 | |
| Slab Run, | 1379 | 1381 | 1404.8 | |

| | | | | |
|--|----------|------|---------|----|
| Falls Creek, bench on top of cap-stone, east abutment of Falls Creek bridge, $1380.667 + 23.8 = 1404.467$. This is an important place for a starting point for lines north and south, | 1379 | 1381 | 1404.8 | 48 |
| Evergreen Water Station, . | 1372 | 1374 | 1397.8 | |
| Maghee's, | 1361 | 1363 | 1386.8 | 52 |
| Panther's Run, bench top of coping small bridge west of Maghee's, | 1362 | | 1385.8 | |
| Reynoldsville, at crossing of Brookville pike, . . . | 1351 | 1353 | 1376.8 | 54 |
| Bridge No. 1, bench top of coping, east abutment. Numbers of bridges refers to the crossing Sandy Lick creek west from Reynoldsville. Small streams not counted, | 1351.707 | | 1375.50 | |
| Bridge No. 2, bench top of coping, east abutment, . | 1348.667 | | 1372.46 | |
| Prior Run, bench top of coping, east abutment, . . . | 1342 | | 1365.8 | |
| Prindible's, | 1334 | 1336 | 1359.8 | |
| McAnnutt's Run, bench on cap-stone, west abutment, . | 1335.35 | | 1359.15 | |
| Bridge No. 5, bench on cap-stone, east abutment, . . . | 1325.951 | | | |
| Camp Run, | 1315 | 1317 | 1340.8 | |
| Fuller's, | 1301 | 1303 | 1326.8 | 61 |
| Wolf Run, | 1293 | 1295 | 1318.8 | |
| Bench on cap-stone, east abutment of Wolf Run Bridge, | 1295.393 | | 1319.19 | |
| Bridge No. 6, bench coping of east abutment, (also known as Rattlesnake rock,) | 1288.60 | | 1312.40 | |
| Iowa Mills, | 1273 | 1275 | 1298.8 | 64 |
| Bell's Mills, | 1242 | 1244 | 1267.8 | 66 |
| Bridge No. 7, Bridge at Garrison's Mills, bench on coping, east abutment, . | 1233.802 | | 1257.60 | |
| Bridge No. 8, bench on coping, east abutment, . . | 1232.122 | | 1256 | |

| | | | | |
|---|----------|------|---------|----|
| Bridge No. 9, <i>Bridge east end of Brookville Tunnel, bench on coping east abutment,</i> | 1218.34 | | 1242.14 | |
| East end of Tunnel, | 1216 | 1218 | 1241.8 | |
| Brookville Station, (<i>Town of Brookville is one mile from station,</i>) | 1209 | 1211 | 1234.8 | 69 |
| Coder's Run, <i>bench on coping, east abutment,</i> | 1199.68 | | 1223.48 | |
| Bridge No. 11, <i>at Puckerty Point, bench on coping, east abutment,</i> | 1190.443 | | 1214.24 | |
| Rattlesnake Run, <i>bench on coping, east abutment,</i> | 1183.151 | | 1207 | |
| Baxter's, | 1180 | 1182 | 1205.8 | |
| Bridge No. 12, <i>east of big cut, bench on coping, east abutment,</i> | 1175.283 | | 1199.08 | |
| Troy, | 1160 | 1162 | 1185.8 | 76 |
| Heathville, | 1135 | 1137 | 1160.8 | |
| Beaver Run Bridge, <i>bench top of south cap-stone, east abutment,</i> | 1136.71 | | 1160.55 | |
| Robinson's Loop Bridge, <i>bench on top of south cap-stone, east abutment,</i> | 1133 | | 1156.8 | |
| Patton's, <i>bench on top of parapet coping of arch culvert, north side of road,</i> | 1107 | | 1130.8 | 81 |
| Maysville, | 1082 | 1084 | 1107.8 | 84 |
| Pine Run, (<i>50 feet span,</i>) | 1075 | 1077 | 1100.8 | |
| Millville, | 1067 | 1069 | 1092.8 | 86 |
| Indiantown Run, (<i>50 feet span,</i>) | 1064 | 1066 | 1089.8 | |
| Fairmount Station, | 1060 | 1062 | 1085.8 | 88 |
| New Bethlehem, | 1054 | 1056 | 1079.8 | 90 |
| Bostonia Junction, (<i>See Table 168,</i>) | 1048 | 1050 | 1073.8 | 91 |
| Anthony's neck, <i>at west end of Tunnel,</i> | 1025 | 1027 | 1050.8 | |
| Leatherwood, (<i>50 feet span of bridge,</i>) | 1001 | 1003 | 1026.8 | 95 |
| Rock Run, <i>bench on parapet coping of arch culvert south side of road,</i> | 940.46 | | 964.26 | |
| Buck Lick Run, | 913 | 915 | 938.8 | |

| | | | | |
|--|---------|-----|--------|-----|
| Lawsonham, bench on parapet coping south side of road, | 893 | 895 | 918.8 | 104 |
| Fiddler's Run arch culvert bench is about fifteen feet below road level, and close to Lawsonham station, . . | 880.903 | | 904.70 | |
| Mortimer Run,* bench on bridge seat coping, east abutment. This bridge is one mile from mouth of Red Bank Creek, | 824.64 | | 848.44 | 109 |
| Red Bank Junction, end of main line connects here with Allegheny Valley RR., (See Table 164,) . . | 825 | 827 | 850.8 | 110 |

* "Table of levels on Bennett's Branch RR. based on an assumed level at Driftwood, supposed to refer to tide at Philadelphia, and subject to correction for any error east of Driftwood."

Elevation at Red Bank Junction, Allegheny Valley RR., as determined by Mr. John F. Carll, February, 1877, 850.8 above Ocean (See Table 164.) Mr. John A. Wilson, to whom I am indebted for above table, gives elevation at Red Bank Junction $825+2'$ for top of rail, =827, which is 23.8 lower than Mr. Carll's elevation at the same point. Assuming that Mr. Carll's elevation is correct, I have added 23.8 feet to the given heights by Mr. Wilson, to reduce same to Ocean level. I think table 166 more reliable than table 165, for the reason that it was carefully prepared by Mr. John A. Wilson, who was the chief engineer in building the Bennett's Branch extension of Allegheny Valley RR., and is therefore thoroughly acquainted with the subject, having in his possession all the notes and papers pertaining to the same. His letter is as follows:

410 WALNUT STREET, PHILADELPHIA, *May 27, 1876.*

I started to correct the table on page 97 and 98, [now table 165,] but found it necessary to make out a new copy, which I have done. I include some points omitted in the printed list, and have stricken out some from the printed list, as they are points which never could be identified except by the engineers who built the road, and consequently are of no value to the general public. A comparison of the inclosed list and the printed list will show the difference. I have noted the addition to be made to the profile elevation to get *top of rail*, which is the proper surface to refer to or to make use of on a finished road. When the final correction is made between Philadelphia and Driftwood, it will be easy to lift this whole line of levels to their proper place. . . .

Respectfully yours,

JOHN A. WILSON.

To Mr. CHARLES ALLEN, of State Geological Survey.

TABLE 167.
SLIGO BRANCH OF A. V. RR.

| STATIONS. | Profile. | Top of rail. | Ocean level. |
|--|--------------|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Lawsonham, <i>Junction, a little west from Lawsonham Station, (See Tables 165, 166,)</i> | 891 | 892 | 915.8 |
| Stop's Run, | 913 | 914 | 937.8 |
| Fiddler's Run, <i>First crossing ; center of trestle,</i> | 966 | 967 | 990.8 |
| 9,000 feet, <i>from the Junction,</i> | 1043 | 1044 | 1067.8 |
| 14,000 feet, | 1141 | 1142 | 1165.8 |
| 15,000 feet, | 1161 | 1162 | 1185.8 |
| 17,000 feet, | 1202 | 1203 | 1226.8 |
| 23,000 feet, | 1325 | 1326 | 1349.8 |
| Benn's Summit, | 1368 | 1369 | 1392.8 |
| 29,000 feet, | 1305 | 1306 | 1329.8 |
| Cherry Run, | 1198 | 1199 | 1222.8 |
| 38,000 feet, | 1218 | 1219 | 1242.8 |
| Sligo Summit, | 1300 | 1301 | 1324.8 |
| Iron Ore Bank, | 1228 | 1229 | 1252.8 |
| 52,000 feet, | 1150 | 1151 | 1174.8 |
| Little Licking Creek, | 1122 | 1123 | 1146.8 |
| Big Licking Creek, | 1102 | 1103 | 1126.8 |
| Sligo, <i>Sligo Furnace is served by this road,</i> | 1090 | 1091 | 1114.8 |
| End of road, | 1085 | 1086 | 1109.8 |

TABLE 168.
BOSTONIA BRANCH OF A. V. RR.

| STATIONS. | Profile. | Top of rail. | Ocean level. |
|--|--------------|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Junction. <i>There are no Stations marked on the profile of this branch. The levels are given at thousand feet from the point of divergence from the main road, (See Table 165,)</i> | 1049 | 1050 | 1073.8 |
| Bridge, | 1050 | 1051 | 1074.8 |
| 2,000 feet, | 1075 | 1076 | 1099.8 |
| 3,000 feet, | 1097 | 1098 | 1121.8 |
| 4,000 feet, | 1118 | 1119 | 1142.8 |
| 5,000 feet, | 1138 | 1139 | 1152.8 |
| 6,000 feet, | 1161 | 1162 | 1185.8 |

NOTE.—Add to the profile elevations on the Sligo and Bostonia Branches 1 foot for tie and rail, and 23.8 feet=24.8 for Ocean level.

TABLE 169.

FALLS CR. TO RIDGEWAY.*(Surveyed Line.)*

| STATIONS, BENCH MARKS, &C. | Profile Elevation. | Ocean level. |
|--|-----------------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Station 0, near Falls Creek Station, B. B. Line, sub-grade, | 1380 | 1405.8 |
| Station 240, Surface of ground, McMinn's Summit, <i>McMinn's Summit is the Boon Mountain divide</i> , | 1599 | 1624.8 |
| Station 305, Foot of hill on Toby waters, near Law's Mill, | 1457 | 1482.8 |
| Station 420, Surface of ground at Brockwayville, | 1430 | 1455.8 |
| Station 420, Ordinary low water in Toby Creek, same place, | 1415 | 1440.8 |
| Bench on floor of bridge over Toby Creek, main Ridgway road, | 1425.30 | 1451.10 |
| Station 1001, Junction of Little Toby Creek with Clarion River, ordinary level of water at this point, | 1295 | 1320.8 |
| Station 1442+87, Junction of surveyed line with Philadelphia and Erie R.R., about 2,500 feet westward from the P. & E. passenger station at Ridgway. Elevation top of rail P. & E. R.R., | 1363 | 1388.8 |
| Bench, Top of up-stream end of pier of public road bridge across Clarion River, below mouth of Elk Creek, in Ridgway, | 1356.960 | 1382.760 |

“Notes of elevation on surveyed lines starting from Bennett's Branch R.R., about $\frac{1}{2}$ mile east of Falls Creek Station, thence running northwardly up Wolf Run to McMinn's Summit, thence via Rattlesnake waters past Law's Mill to Brockwayville, thence down Toby Creek to the Clarion, and up the Clarion to Ridgway, on the Phila. & Erie R.R.

“NOTE.—Falls Creek Station is sometimes called Evergreen, and is so spoken of by Mr. Platt in his reports. Evergreen Station, for which I have noted an elevation in the Bennett's Branch list, is a water station west of Falls Creek, which latter is at mouth of Wolf Run. Each station in this survey=100 ft.”

The above elevations were furnished by Mr. John A. Wilson, 410 Walnut street, Phila. I have added to each elevation, as given by Mr. Wilson, 25.8 feet, viz: 2 feet, to bring the same to top of rail on the Bennett's

Branch R.R., and 23.8 feet to conform with Ocean level, as determined by Mr. John F. Carll, February, 1877, at Red Bank Junction, on Allegheny Valley R.R. (See Table 164.)

TABLE 170.
PARKER AND KARNS CITY R.R.

| STATIONS. | Above tide. | Ocean level. | Dist. from Parker Junc. |
|--|--------------|--------------|----------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Parker Junction, <i>with Allegheny Valley R.R., (See Table 164,)</i> | 114 | 888 | 0 |
| Stone House, | 315 | 1089 | 4 |
| Martinsburg, | 330 | 1104 | 5½ |
| Argyle, | 386.80 | 1161 | 7 |
| Petrolia, | 401 | 1175 | 8 |
| Central Point, | 410 | 1184 | 8½ |
| Karns City, | 430.33 | 1204 | 10 |

Levels of the Parker & Karns City R.R. were taken from notes in possession of Mr. Wm. M. Kipp, Engineer at Parker City. The datum of the preliminary survey was an assumed level 100 feet below the top of the west abutment, of the iron bridge then building. This datum (as shown by subsequent surveys in locating the line,) is 103.99' below the top of the free-stone base of the toll-house. The bridge rises 8' going east, and there is a further rise from the end of the bridge to the A. V. R.R. depot of 1.98', as ascertained by Mr. J. F. Carll, which will make the datum of P. & K. C. R.R. below the A. V. R.R. depot $103.99 + 8 + 1.98 = 113.97'$. Elevation A. V. R.R. depot, Parker City, $888 - 114 = 774$ = datum, which, added to the elevations as copied from notes, should bring levels to tide.

TABLE 171.
PITTSBURGH, TITUSVILLE AND BUFFALO R.R.
(A. From Profile.)

| STATIONS. | Profile. | Ocean level. |
|--|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Irvineton, <i>Junction with P. & E. R.R., (See Table 129,)</i> | 1158 | 1171 |
| Dunn's Eddy, | 1144 | 1157 |
| Penna. House, | 1140 | 1153 |
| Thompson's, | 1130 | 1143 |
| Cobham, | 1121 | 1134 |
| Magee, | 1118 | 1131 |
| Tidioute, | 1099 | 1112 |
| Trunkeyville, | 1085 | 1098 |

| | | |
|---|------|------|
| Hickory, | 1078 | 1091 |
| Dawson, | 1063 | 1076 |
| Jamison, | 1060 | 1073 |
| Tionesta, | 1047 | 1060 |
| Hunter, | 1048 | 1061 |
| Stewart, | 1034 | 1047 |
| President, | 1035 | 1048 |
| Eagle Rock, | 1033 | 1046 |
| Henry's Bend, | 1022 | 1035 |
| Oleopolis, | 1019 | 1032 |
| Walnut Bend, | 1010 | 1023 |
| Rockwood, | 1003 | 1016 |
| Imperial, | 995 | 1008 |
| Oil City, (<i>See Table 193,</i>) | 995 | 1008 |
| McClintock, | 1045 | 1058 |
| Rouseville, | 1026 | 1039 |
| Rynd Farm, | 1030 | 1043 |
| Tarr Farm, | 1049 | 1062 |
| Columbia, | 1054 | 1067 |
| Petroleum Centre, | 1076 | 1089 |
| Boyd Farm, | 1073 | 1086 |
| Pioneer, | 1086 | 1099 |
| Shaffer, | 1120 | 1133 |
| Miller's Farm, | 1118 | 1131 |
| Titusville, (<i>See Tables 178, 176,</i>) | 1181 | 1194 |
| Hydetown, | 1239 | 1252 |
| Bridge, near Hydetown, | 1241 | 1254 |
| Gray's Mills, | 1266 | 1279 |
| Meyer's Switch, | 1230 | 1243 |
| Tryonville, | 1305 | 1318 |
| Centreville, | 1284 | 1297 |
| Glynden, | 1335 | 1348 |
| Spartansburg, | 1444 | 1457 |
| Summit, | 1634 | 1647 |
| Stewart's Switch, | 1460 | 1473 |
| A. & G. W. RR. Crossing, (<i>See Table 196,</i>) | 1433 | 1446 |
| Corry, <i>Junction with P. & E. RR.,</i> (<i>See Table 129,</i>) | 1420 | 1433 |

Levels on the Pittsburgh, Titusville and Buffalo RR. (formerly Oil Creek and Allegheny River RR.) were copied from the profile in the office of the Company, at Oil City, by permission of C. J. Hepburn, Esq., Superintendent.

Datum: P. & E. RR. 13 feet has been added to profile elevations for ocean level, in accordance with Mr. Carll's determination of height of Union depot, Oil City.

TABLE 172.
PITTSBURGH, TITUSVILLE AND BUFFALO RR.
(B. Official Notes.)

| STATIONS. | Profile Elevation. | Ocean Level. | Dist. from Junction. |
|--|-----------------------|-----------------|-------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Junction P. & E. RR., Irvineton, . | 1157.2 | 1170.2 | 0 |
| Irvineton Station, | 1155.0 | 1168.0 | 0 |
| Culvert 800 ft. S. of Irvineton Sta., | 1151.5 | 1164.5 | 0.2 |
| Opposite Mile Post, | 1149.7 | 1162.7 | 1.0 |
| Do. do. | 1146 | 1159 | 2.0 |
| Culvert 2500 S. of 2d M. P., | 1143 | 1156 | 2.5 |
| Opp. Mile Post, | 1141.2 | 1154.2 | 3.0 |
| Do. do. | 1140.0 | 1153.0 | 4.0 |
| Culvert 500 ft. S. of 4th M. P., . . . | 1138.7 | 1151.7 | 4.1 |
| Culvert 350 ft. N. of 5th M. P., . . | 1137 | 1150 | 4.9 |
| Opp. Mile Post, | 1137 | 1150 | 5.0 |
| Culvert 500 ft. N. of 6th M. P., . . | 1131 | 1144 | 5.9 |
| Opp. Mile Post, | 1131.4 | 1144.4 | 6.0 |
| Bridge 2000 ft. S. of 6th M. P., . . | 1130 | 1143 | 6.4 |
| Opp. Mile Post, | 1129 | 1142 | 7.0 |
| Do. do. | 1125.5 | 1138.5 | 8.0 |
| Do. do. | 1121 | 1134 | 9.0 |
| Do. do. | 1118 | 1131 | 10.0 |
| Culvert 300 ft. South 10th M. P., . . | 1118 | 1131 | 10.1 |
| Opp. Mile Post, | 1117.5 | 1130.5 | 11.0 |
| Culvert 500 ft. N. 12th M. P., . . . | 1115 | 1128 | 11.9 |
| Opp. Mile Post, | 1114 | 1127 | 12.0 |
| Do. do. and on Bridge, | 1112.5 | 1125.5 | 13.0 |
| Do. do. | 1107.6 | 1120.6 | 14.0 |
| Tidioute Creek Bridge, N. end, . . . | 1096.1 | 1109.1 | |
| Opp. Mile Post, | 1099 | 1112 | 15.0 |
| Dennis Run Bridge, | 1100.6 | 1113.6 | |
| Opp. Mile Post, | 1105.8 | 1118.8 | 16.0 |
| Groves Run Bridge, N. end, | 1101 | 1114 | |
| Opp. Mile Post, | 1096 | 1109 | 17.0 |
| Do. do. | 1090 | 1103 | 18.0 |
| Do. do. | 1088 | 1101 | 19.0 |
| Culvert 1300 ft. N. of 20th M. P., . | 1084 | 1097 | 19.8 |
| Opp. Mile Post and on Bridge, . . . | 1085.7 | 1098.7 | 20.0 |
| Do. do. | 1087.2 | 1100.2 | 21.0 |
| Do. do. | 1079 | 1092 | 22.0 |
| Do. do. | 1083 | 1096 | 23.0 |
| Culvert 1200 ft. N. of 24th M. P., . | 1078.8 | 1091.8 | 23.8 |
| Opp. Mile Post, | 1064 | 1077 | 24.0 |
| Culvert 600 ft. S. of 24th M. P., . . | 1062.8 | 1075.8 | 24.1 |
| Opp. Mile Post, | 1059.1 | 1072.1 | 25.0 |
| Do. do. | 1066.8 | 1079.8 | 26.0 |

| | | | |
|---------------------------------------|--------|--------|------|
| Dawson Run bridge, N. end, . . . | 1062.8 | 1075.8 | |
| Opp. Mile Post, | 1064 | 1077 | 27.0 |
| Do. do. | 1060.7 | 1073.7 | 28.0 |
| Do. do. | 1054.5 | 1067.5 | 29.0 |
| Culvert 300 ft. N. Tionesta Sta., . . | 1047.0 | 1060 | 29.5 |
| Opp. Mile Post, | 1054.4 | 1067.4 | 30.0 |
| Do. do. | 1054 | 1067 | 31.0 |
| Do. do. | 1047.3 | 1060.3 | 32.0 |
| Do. do. | 1049.3 | 1062.3 | 33.0 |
| Do. do. | 1041.2 | 1054.2 | 34.0 |
| Culvert 100 ft. South Baum Sta., . | 1033.7 | 1046.7 | 34.9 |
| Opp. Mile Post, | 1033.4 | 1046.4 | 35.0 |
| Do. do. | 1033 | 1046 | 36.0 |
| Do. do. | 1032 | 1045 | 37.0 |
| Do. do. | 1033.6 | 1046.6 | 38.0 |
| Muskrat Run Bridge, N. end, . . . | 1022 | 1035 | |
| Opp. Mile Post, | 1022 | 1035 | 39.0 |
| Culvert 200 ft. S. Henry's Bend Sta., | 1021.2 | 1034.2 | 39.3 |
| Opp. Mile Post, | 1026.8 | 1039.8 | 40.0 |
| Howe Truss Bridge 800 ft. N. 41st. | | | |
| M. P., N. end, | 1025.4 | 1038.4 | 40.8 |
| Opp. Mile Post, | 1020.9 | 1033.9 | 41.0 |
| Do. do. | 1015.5 | 1028.5 | 42.0 |
| Do. do. | 1009.5 | 1022.5 | 43.0 |
| Do. do. | 1009.0 | 1022.0 | 44.0 |
| Do. do. | 1016.4 | 1029.4 | 45.0 |
| Culvert 400 ft. N. of 46th M. P., . . | 1008.0 | 1021.0 | 45.9 |
| Opp. Mile Post, | 1010.0 | 1023.0 | 46.0 |
| Do. do. | 1000 | 1013 | 47.0 |
| Do. do. | 1000.6 | 1013.6 | 48.0 |
| Do. do. | 999.3 | 1012.3 | 49.0 |
| Stone Box Culvert 1300 ft. S. of | | | |
| 49th M. P., | 997.5 | 1010.5 | 49.3 |
| Small Drain at Water Tank, . . . | 996.3 | 1009.3 | |
| Junction with A. V. R.R., | | 1009.7 | |
| Center St. Crossing, Oil City, . . | 996.8 | 1009.8 | 50.2 |
| Howe Truss Bridge, South end, . . . | 1000.9 | 1013.9 | |
| Opp. Mile Post, | 1014.8 | 1027.8 | 52.0 |
| Howe Truss Bridge, S. end, | 1018.1 | 1031.1 | |
| Opp. Mile Post, | 1024.0 | 1037.0 | 53.0 |
| Do. do. | 1029.2 | 1042.2 | 54.0 |
| Do. do. | 1042.0 | 1055.0 | 55.0 |
| Howe Truss Bridge, S. end, | 1050.8 | 1063.8 | |
| Opp. Mile Post, | 1055.6 | 1068.6 | 56.0 |
| Do. do. | 1073.4 | 1086.4 | 57.0 |
| Howe Truss Bridge, S. end, | 1076.2 | 1089.2 | |
| Opp. Mile Post, | 1086.0 | 1099.0 | 58.0 |
| Howe Truss Bridge, S. end, | 1087.8 | 1100.8 | |

| | | | |
|--|--------|----------|------|
| Opp. Mile Post, | 1097.0 | 1110.0 | 59.0 |
| Do. do. | 1108.0 | 1121.8 | 60.0 |
| Do. do. | 1120.8 | 1133.8 | 61.0 |
| Do. do. | 1118.8 | 1131.8 | 62.0 |
| Do. do. | 1140.3 | 1153.3 | 63.0 |
| Do. do. | 1164.0 | 1177.0 | 64.0 |
| Do. do. | 1186.0 | 1199.0 | 65.0 |
| Do. do. | 1202.0 | 1215.0 | 66.0 |
| Do. do. | 1187.2 | 1200.2 | 67.0 |
| Franklin St. Crossing, Titusville, | | 1194.0 | 67.1 |
| Washington St. do. | | 1194.2 | 67.3 |
| Monroe do. do. | | 1194.7 | 67.5 |
| Opp. Mile Post, | 1193.0 | 1206.0 | 68.0 |
| Do. do. | 1207.0 | 1220.0 | 69.0 |
| Do. do. | 1224.0 | 1237 | 70.0 |
| Howe Truss Bridge, S. end, | 1241.2 | 1254.2 | |
| Opp. Mile Post, | 1235.5 | 1248.5 | 71.0 |
| Do. do. | 1230.0 | 1243.0 | 72.0 |
| Do. do. | 1255.6 | 1268.6 | 73.0 |
| Do. do. | 1271.7 | 1284.7 | 74.0 |
| Do. do. | 1283.2 | 1296.2 | 75.0 |
| Do. do. | 1303.0 | 1316.0 | 76.0 |
| Do. do. | 1291.0 | 1304.0 | 77.0 |
| Culvert 100 ft. South 78th M. P., | 1283.0 | 1296.0 | 78.0 |
| Culvert 100 ft. N. 79th M. P., | 1311.0 | 1324.0 | 79.0 |
| Opp. Mile Post, | 1313.0 | 1326.0 | 80.0 |
| Culvert 460 ft. N. 81st M. P., | 1326.0 | 1339.0 | 81.1 |
| Do. 160 ft. N. 82d M. P., | 1339.0 | 1352.0 | 82.0 |
| Do. 130 ft. N. 83d M. P., | 1363.8 | 1376.8 | 83.0 |
| Opp. Mile Post, | 1413 | 1426.0 | 84.0 |
| Culvert 950 ft. N. 84th M. P., | 1416.5 | 1429.5 | 84.2 |
| Spartansburg Trestle, S. end, | 1440.6 | 1453.6 | |
| Trestle 500 ft. N. 86th M. P., | 1443.4 | 1456.4 | 86.1 |
| Do. 1000 ft. S. 87th M. P., | 1486.6 | 1499.6 | 86.8 |
| Opp. Mile Post, | 1496 | 1509 | 87.0 |
| Trestle 150 ft. S. of 88th M. P., | 1580 | 1593 | 88.0 |
| Summit 1800 ft. S. of 89th M. P., | 1633.5 | 1646.5 | 88.7 |
| Opp. Mile Post, | 1620 | 1633 | 89.0 |
| Do. do. | 1573 | 1586 | 90.0 |
| Culvert 1600 ft. N. 90th M. P., | 1542 | 1555 | 90.3 |
| Do. 60 ft. S. 91st M. P., | 1586.4 | 1499.4 | 91.0 |
| Do. 40 ft. S. 92d M. P., | 1468.0 | 1481.0 | 92.0 |
| Opp. Mile Post, | 1445 | 1458 | 93.0 |
| Corry Junction with B. C. & P. R.R. | 1432.8 | (1445.5) | 93.5 |
| Do. Crossing, 1st Avenue, | 1425.7 | (1439.2) | 94.2 |
| Do. do. Center St., | 1421 | 1434 | 94.3 |

| | | | |
|--|--------|--------|------|
| Corry Crossing, P. E. & A. G. W. R.R. <i>There seems to be 4' error in the levels of this road, consequently this crossing is given as 1431 instead of 1427, as it should be, by the proven levels of the P. & E. R.R. The error is probably between Tryonville and Corry,</i> | (1418) | (1431) | 94.4 |
|--|--------|--------|------|

Copied from notes in the office of the Chief Engineer at Oil City, Feb., 1877, through the kindness of Frank M. Ashmead, C. E., by J. F. Carll. The elevations given are Top of Rail at the points named in the table. The figures in the 1st Column are those on the R.R. Profile, to which 13.0 ft. have been added to bring them up to our accepted elevation of Oil City Union Depot = 1008 ft. The datum is given on the profile as follows: "Elevation of track on bridge east of Irvineton Station, on P. & E. Ry. above tide-water at west end of Market St. Bridge, at Philadelphia, = 1160 ft."

TABLE 173.
PITTSBURGH, TITUSVILLE AND BUFFALO RR.
(C., J. F. Carll.)

| STATIONS. | Profile. | Ocean Level. | *Dis. from Irvineton. |
|--|----------|--------------|-----------------------|
| | Feet. | Feet. | Miles. |
| Irvineton, <i>The point here referred to is on the P., T. & B. R.R. (formerly Oil Creek and Allegheng River R.R.) track, on the south side of the P. & E. R.R. Depot, and is 1.91 lower than the P. & E. R.R. track,</i> | 1155 | 1168 | 0 |
| Dunn's Eddy, | 1143 | 1156 | 2.6 |
| Pennsylvania House, | 1138 | 1151 | 4.1 |
| Thompson's, | 1130 | 1143 | 6.6 |
| Cobham, | 1124.3 | 1137.3 | 8.9 |
| Magee, | 1117.7 | 1130.7 | 11.1 |
| Tidioute, | 1100.3 | 1113.3 | 14.8 |
| Trunkkeyville, | 1085.7 | 1098.7 | 20.1 |
| Hickory, | 1078.8 | 1091.8 | 23.3 |
| Dawson's, | 1063.2 | 1076.2 | 26.2 |
| Jamieson, | 1060.5 | 1073.5 | 28.1 |
| Tionesta, | 1047.0 | 1060.0 | 29.6 |
| Hunter's, (Road Crossing,) . . . | 1048.3 | 1061.3 | 32.5 |
| Baum or Stewart's Run, | 1034 | 1047.0 | 34.9 |

| | | | |
|--|--------|--------|------|
| President, | 1035 | 1048— | 36.8 |
| Eagle Rock, | 1033.4 | 1046.4 | 38.0 |
| Henry's Bend, | 1022— | 1035— | 39.3 |
| Oleopolis, | 1019— | 1032— | 41.3 |
| Walnut Bend, | 1010.4 | 1023.4 | 43.2 |
| Rockwood, | 1003.3 | 1016.3 | 46.5 |
| Oil City—Union Depot, | 995.0 | 1008.0 | 50.2 |
| McClintock, (old sta.=1047.6,) | 1047.6 | 1060.6 | 52.5 |
| Rouseville, | 1024— | 1037 | 53.4 |
| Rynd Farm, | 1030 | 1043 | 54.4 |
| Tarr Farm, | 1050 | 1063 | 55.6 |
| Columbia, | 1054 | 1067 | 56.1 |
| Petroleum Center, | 1076.2 | 1089.2 | 57.6 |
| Boyd Farm, | 1072.6 | 1085.6 | 58.1 |
| Pioneer, | 1086.2 | 1099.2 | 59.1 |
| Shaffer, | 1118.2 | 1131.2 | 61.3 |
| Miller Farm, | 1117.6 | 1130.6 | 62.3 |
| Titusville, | 1181 | 1194— | 67.2 |
| Hydetown, | 1239— | 1252— | 71.4 |
| Tryonville, | 1307.1 | 1320.1 | 75.9 |
| Centerville, | 1283.4 | 1296.4 | 78.7 |
| Glynden, | 1335.4 | 1348.4 | 82.3 |
| Spartansburg, | 1442.3 | 1455.3 | 85.4 |
| Corry Station, <i>same point as A. & G. W. and P. & E., Corry Station,</i> | 1420.2 | 1433.2 | 94.3 |

* The station distances here given are from the published R.R. time tables, and may not always coincide with the mile posts of Table No. 172. They appear to have been given from some earlier measurement, which does not exactly agree with the present profile.

Above table of elevations and notes furnished by Mr. J. F. Carl, Second Geological Survey of Pennsylvania. Thirteen feet is added to the first column, to bring the elevations to agree with the proven height of Oil City, 1008.

TABLE 174.
PITHOLE VALLEY RR.

| STATIONS. | Above Oleopolis. | +Lake Erie. | Ocean Level. |
|--|---------------------|----------------|-----------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Oleopolis, (<i>See Tables 171, 172, 173.</i>) | 0 | 446 | 1019 |
| Wood's Mills, | | | |
| Prather, | 232 | 678 | 1251 |
| Pithole City, | 290 | 736 | 1309 |
| Pleasantville, | 615 | 1061 | 1634 |
| Enterprise, | 242 | 688 | 1261 |
| Titusville, (<i>See Tables 171, 172, 173.</i>) | 162 | 608 | 1181 |

Levels on the Pithole Valley R.R. were furnished by Mr. Aug. Mordecai, Assistant Engineer A. & G. W. R.R., at Meadville, Pa.

TABLE 175.
BUFFALO AND SOUTH-WESTERN RR.

| LOCALITY. | Station. | + L. Erie. | Ocean Level. |
|---|--------------|--------------|-----------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> |
| Jamestown, N. Y., | 3850 | 737 | 1310 |
| A. & G. W. R.R. Crossing, (<i>See Table 196.</i>) | 3843 | 732 | 1305 |
| Outlet to Chatauqua Lake, (<i>Depth of outlet at crossing 35 feet.</i>) . . | 3770 | 724 | 1297 |
| | 3726 | 693 | 1266 |
| Dunkirk, Allegheny Valley and Pittsburgh R.R. Crossing, (<i>See Table 176.</i>) | 3681 | 687 | 1260 |
| | 3625 | 674 | 1147 |
| | 3587 | 688 | 1261 |
| | 3460 | 681 | 1254 |
| | 3430 | 693 | 1266 |
| Kennedy Station, | 3370 | 688 | 1261 |
| | 3310 | 686 | 1259 |
| Conewango Creek, | 3250 | 697 | 1270 |
| | 3243 | 693 | 1266 |
| | 3092 | 698 | 1271 |
| | 3060 | 702 | 1275 |
| | 3037 | 709 | 1282 |
| | 3000 | 698 | 1271 |

| | | | |
|--|--------------------------------|--------------------------------|-----------------------------------|
| County Line, between Chatauqua and Cattaragus Town of Cone- wango, | 2965+77 2920 | 705 707 | 1278 1280 |
| Town Line, between Cherry Creek and Ellington, | 2880 2800 | 717 714 | 1290 1287 |
| County Line, between Cattaragus and Chatauqua, | 2543+20 | 715 | 1288 |
| Town Line, between Dayton and Leon, | 2530+40 2420 2245 | 717 728 753 | 1290 1301 1326 |
| Dayton Summit, | 2200 | 752 | 1325 |
| Crosses under the Erie RR., near Dayton Summit, | 1813 1614 | 713 214 | 1286 787 |
| Gowanda, | 1600 | 203 | 776 |
| Cattaragus Creek, County Line between Erie and Cattaragus, . | 1585 1573 1500 1420 | 203.75 205 292 287 | 777 778 865 860 |
| North Branch Clear Creek, . . . | 1340 | 275 | 848 |
| North Collins, | 1040 860 | 273 221 | 846 794 |
| Eden, | 810 720 | 237 214 | 810 787 |
| North branch 18 mile creek, . . . | 690 | 200 | 773 |
| Bed of creek, | | 148 | 721 |
| Hamburg, | 520 320 170 120 90 | 227 13 13 25.6 9.3 | 800 586 586 599 582.3 |
| Junction, with the Buffalo Creek RR., in the City of Buffalo, where said Buffalo Creek RR. crosses the L. S. and M. S. RR., all being same grade, (See Table 195,) . . | | 9.3 | 582.3 |

Elevations on Buffalo and South-Western RR. were furnished by Mr. T. Guilford Smith, Sect'y of Union Iron Company, N. Y., who received his information from Mr. George E. Mann, a former assistant engineer, B. & S. W. RR., and now Deputy City Engineer, Buffalo. Mr. Mann says: "The heights are shown in feet, above the ordinary water level of Lake Erie (or base line of levels assumed in Buffalo.) I have taken the heights at all material changes of grade. The stations are in distances

of 100 feet. Station 1585 gives a distance of 158,500 feet from Buffalo, and so to any point in the line." 573 feet, the accepted elevation of Lake Erie above Ocean, has been added to each height given by Mr. Mann, to reduce same to Ocean level.

TABLE 176.

DUNKIRK, ALLEGHENY VALLEY AND PITTSBURGH RR.

| STATIONS. | + Lake Erie. | Ocean level. | Dist. from Titusville. |
|--|--------------|--------------|------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Titusville, (<i>See Tables 171, 172, 173,</i>) | 608 | 1181 | 0 |
| East Titusville, | 605 | 1178 | 1 |
| Grand Valley, | 768 | 1341 | 9 |
| Star, | 803 | 1376 | |
| Newton, | 838 | 1411 | 11 |
| Summit. <i>This is surface of the ground, not the top of rail,</i> | 893 | 1466 | |
| Garland, | 720 | 1293 | 19 |
| Pittsfield, | 672 | 1245 | 23 |
| Youngsville, | 624 | 1197 | 27 |
| Irvineton, | 591 | 1164 | 29 |
| Jackson, | 608 | 1181 | |
| Warren, | 627 | 1200 | 35 |
| North Warren, | 643 | 1216 | |
| Russelburg, | 660 | 1233 | 43 |
| Ackley's, | 663 | 1236 | |
| Fentonville, <i>State Line of Pennsylvania and New York,</i> . . | 670 | 1243 | 48 |
| Frewsburg, | 688 | 1261 | 52 |
| A. & G. W. RR. Crossing, (<i>See Table 196,</i>) | 689 | 1262 | 57 |
| Falconer, | 685 | 1258 | 58 |
| Ross Mill, | 689 | 1262 | |
| Vermont, | 722 | 1295 | 63 |
| Sinclairville, | 757 | 1330 | 68 |
| Moon's, | 730 | 1303 | 72 |
| Cassadago, <i>Surface of water 732+Lake Erie 573=1305'</i> | | | |
| <i>Ocean level,</i> | 736 | 1309 | 76 |
| Skidmore, | 744 | 1317 | |
| Norton's, | 418 | 991 | 81 |
| Laona, | 239 | 810 | 85 |
| Fredonia, | 192 | 765 | 87 |

| | | | |
|--|----|-----|----|
| Dunkirk. <i>On the list from which the above levels were copied, no elevation was noted at Dunkirk, but as the D., A. V. & P. R.R. and the L. S. & M. S. R.R. use the same depot, the tracks being on the same level, and the elevation as given on profile of L. S. & M. S. R.R. taken as correct, it is therefore adopted as the elevation at the terminus of this road, (See Tables 195, 98,)</i> | 25 | 598 | 90 |
|--|----|-----|----|

Levels on the Dunkirk, Allegheny Valley and Pittsburgh R.R. were copied from a list furnished by Mr. Henry E. Wrigley, C. E., who obtained the levels from the Engineer in charge of the road, and corrected by Mr. S. H. Doty, Engineer, Warren, Pa.

Datum : Lake Erie.

NOTE.—Surface of water outlet of Chataqua Lake 675+Lake Erie 573=1248' Ocean level. Elevation of water surface of Chataqua Lake as published in "Lists of Elevations" by Henry Gannett, M. E., Washington, D. C., 1877, 1291 feet above Ocean, and by Buffalo and South Western R.R., (see Table 175,) 724+573=1297.

TABLE 177.
UNION AND TITUSVILLE R.R.

| STATIONS. | Profile Elevations. | Corrected Levels. | Dist. from Irvineton. |
|---|---------------------|-------------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Titusville, | 1181 | 1194 | 67 2 |
| Tryonville Junction, (<i>See Tables 171, 172, 173,</i>) | | | |
| Mile post, | 1307 | 1320 | 75.9 |
| Do. | 1302 | 1315 | 76.0 |
| Do. | 1274 | 1287 | 77.0 |
| Noble's, | 1285 | 1298 | 77.7 |
| Mile post, | 1278 | 1291 | 78.0 |
| Do. | 1294 | 1307 | 79.0 |
| Do. | 1294 | 1307 | 80.0 |
| Do. | 1344 | 1357 | 81.0 |
| Riceville, | 1356.3 | 1369.3 | 81.2 |
| Mile post, | 1368 | 1381 | 82.0 |
| Do. | 1369 | 1382 | 83.0 |
| Lincolntonville, | 1368.9 | 1381.9 | 83.3 |
| Mile post, | 1386 | 1399 | 84.0 |

| | | | |
|---|----------|----------|------|
| Lakeville, | 1398.7 | 1411.7 | 84.4 |
| Mile post, | 1393 | 1406 | 85.0 |
| Do. | 1394 | 1407 | 86.0 |
| Do. | 1418 | 1431 | 87.0 |
| Do. | 1445 | 1458 | 88.0 |
| Do. | 1401 | 1414 | 89.0 |
| Do. | 1363 | 1376 | 90.0 |
| Do. | 1326 | 1339 | 91.0 |
| Crossing A. & G. W. RR., (<i>See Table 196,</i>) | 1290.7 | 1303.7 | 91.6 |
| Union City, P. & E. Depot, (<i>See Table 129,</i>) | (1258.4) | (1271.4) | 92.0 |
| Union City, P. & E. Junction, (<i>See Table 129,</i>) | 1257 | 1270 | 92.0 |
| Union City, A. & G. W. Depot, (<i>See Table 196,</i>) | (1288.5) | (1301.5) | 92.1 |

The Union and Titusville and the Pittsburgh, Titusville and Buffalo RRs. now use the same track from Titusville to the Junction, a short distance above Tryonville.

The elevations given are for the top of the rail opposite the points named in the table.

This road runs to both the depot of the P. & E. RR. and that of the A. & G. W. RR. in Union, using the A. & G. W. track at their depot and a track of equal elevation with the P. & E. at the P. & E. depot.

The above table of elevations and notes are furnished by Mr John F. Carl.

TABLE 178.

PENNSYLVANIA AND PETROLEUM RR.

| STATIONS. | + Lake Erie. | Ocean level. | |
|---|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Titusville, (<i>See Tables 171, 172, 173, 174,</i>) | 608 | 1181 | |
| Newton's Mills, | 685 | 1258 | |
| Athens Mills, | 693 | 1266 | |
| Little Cooley, | 630 | 1203 | |
| Teeple Town, | 631 | 1204 | |
| Cambridge, | 585 | 1158 | |
| Edinboro', | 639 | 1212 | |
| Summit, | 705 | 1278 | |
| McKean's Corner, | 480 | 1053 | |
| Erie, (<i>See Table 195,</i>) | | | |

Levels on the Pennsylvania and Petroleum R.R. were furnished by Mr. Aug. Mordecai, Asst. Eng. A. & G. W. R.R., Meadville, Pa.

Datum: Lake Erie.

NOTE.—The above levels are from the preliminary survey. The road is not yet built, but the proposed line is from Titusville to Erie.

TABLE 179 (a.)
BUFFALO, CORY AND PITTSBURGH R.R.

| STATIONS. | Above Tide. | | Dist. from Cory Jun. |
|--|--------------|-----------|----------------------|
| | <i>Fect.</i> | | <i>Miles.</i> |
| Corry Junction, (<i>See Tables 129, 171, 172, 173, 196,</i>) (a.) | 1423 | | 0 |
| Childs, | 1474 | | |
| State Line, | 1417 | | 8 |
| Clymer, | 1146 | | 8 |
| Panama, | 1545 | | 12 |
| Sherman, | 1568 | | 18 |
| Summerdale, | 1629 | | 22 |
| Mayville, | 1300 | | 28 |
| Prospect, | 1221 | | 34 |
| Brocton, <i>Junction with L. S. & M. S. R.R.. Elevation on L. S. & M. S. R.R. at this point is 724' above mean surface of Atlantic ocean,</i> (See Table 194,) | 672 | | 42 |

Levels on the Buffalo, Corry and Pittsburgh R.R. were obtained in Oil City, through kindness of Mr. C. J. Hepburn, Supt. O. C. & A. R. R.R.

(a.) The levels on this road are supposed to be correct, and may be entirely so, but the profile from which the elevations were copied is indefinite as to the exact location of the stations.

IX. OHIO LINE SERIES.

TABLE 180.

PITTSBURGH, CINCINNATI AND ST. LOUIS RR.

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Pittsb'gh. |
|---|--------------|--------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Pittsburgh, <i>Pittsburgh Union Depot, (746', Gardner,) (See Tab. I.)</i> | 738 | 745 | 0 |
| Birmingham, <i>south side of Ohio river,</i> | 759 | 766 | 1 |
| Jones' Ferry, | 750 | 757 | |
| Temperanceville, | 760 | 767 | |
| Sheridan, | 839 | 846 | 4 |
| Cork Run Tunnel Summit, | 864 | 871 | |
| Ingram, | 864 | 871 | 5 |
| Crafton, | 872 | 879 | |
| Idlewood, | 840 | 847 | |
| Bridge No. 3, Chartiers Creek Crossing, | 807 | 814 | |
| Bridge No. 4, Public Road, | 787 | 794 | |
| Bridge No. 5, Campbell's Run, | 764 | 771 | |
| Mansfield, <i>Junction with Chartiers RR., (See Table 181.)</i> | 766 | 773 | 8 |
| Walker's Mill, | 826 | 833 | 11 |
| Oakdale, | 899 | 906 | 14 |
| Noblestown, | 919 | 926 | 15 |
| Willow Grove, | 979 | 986 | |
| McDonald's, | 972 | 979 | 18 |
| Primrose, | 1014 | 1021 | |
| Midway, | 1099 | 1106 | 21 |
| Bulger, | 1149 | 1156 | 23 |
| Bulger Summit, | 1155 | 1162 | |
| Bridge No. 17, | 1009 | 1016 | |
| Burgettstown, | 1004 | 1011 | 27 |
| Dinsmore Summit, | 1089 | 1096 | |
| Dinsmore, | 1052 | 1059 | |
| Hanlon's, | 935 | 942 | 32 |
| Bridge No. 19, | 863 | 870 | |
| Paris Road, | 828 | 835 | |
| Pa. State Line, | 825 | 832 | |
| Bridge No. 22, | 818 | 825 | |
| Collier's, <i>in Virginia,</i> | 800 | 807 | 36 |
| Holliday Cove, | 714 | 721 | 39 |

| | | | |
|--|-----|-----|------|
| Edgington, $\frac{3}{4}$ mile east of the Ohio river, | 697 | 704 | 41.4 |
| Ohio River Bridge, 91' feet above low water mark in the Ohio river, | 712 | 719 | |
| Steubenville, Junction C. & P. RR., River Division, is not at Steubenville but at Mingo Junction, three miles south of Steubenville. The Junction of the two RR.'s is made by a siding on a heavy grade, and the main tracks differ in elevation at the Junction some ten feet, P. C. & St. Louis being the higher, (See Table 186,) | | | |

Levels of the Pittsburgh, Cincinnati and St. Louis RR. were copied from profile in the office of the company at Pittsburgh, Pa. The profile was furnished by Mr. S. M. Felton, Jr., General Superintendent, and corrected by Mr. M. J. Becker, Chief Engineer.

Datum: Pennsylvania RR. levels? Add 7' for Ocean level.

TABLE 181.
CHARTIERS RR.

| STATIONS. | Mean tide. | Ocean Level | Dist. from Mansfield. |
|---|--------------|--------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Mansfield, Junction with Pittsburgh, Cincinnati and St. Louis RR., (See Table 181,) | 766 | 773 | 0 |
| Leasdale, | 787 | 794 | 1 |
| Woodville, | 797 | 804 | 2 |
| Bridgeville, | 815 | 822 | 4 |
| Boyce's, | 858 | 865 | 7 |
| Hill's, | 893 | 880 | 9 |
| Greer's, | 896 | 903 | 10 |
| Van Emman's, | 915 | 922 | 11 |
| Morganza, | 931 | 938 | |
| Cannonsburg, | 928 | 935 | 14 |
| Houston's, | 942 | 949 | 15 |
| Johnston's, | 964 | 971 | |
| Ewing's Mills, | 971 | 978 | 18 |
| Cook's, | 996 | 1003 | 20 |
| Washington, | 1024 | 1031 | 23 |

Elevations on the Charters Branch RR., were furnished by Mr. M. J. Becker, Chief Engineer P. C. & St. L. Railway, Columbus, Ohio.

Add 7' to reduce to Ocean level.

TABLE 182.

**WHEELING, PITTSBURGH AND BALTIMORE
BRANCH OF B. & O. RR.***(Formerly Hempfield RR.)*

| STATIONS. | Mean Tide. | Ocean Level. | Dist. from Washington. |
|---|---------------|-----------------|---------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Washington, <i>Continuation of the Chartiers RR., (See Table 181,)</i> | 1049 | | 0 |
| Thompson's Mills, | 1108 | | |
| Chartier, | | | 4 |
| Taylorville, | 1008 | | 7 |
| Claysville, | 1143 | | 11 |
| Vienna, | | | 14 |
| West Alexander, | 1043 | | 16 |
| Valley Grove, | | | 20 |
| Point Mills, | 896 | | 22 |
| Roney's Point, | 829 | | 23 |
| Triadelphia, | 735 | | 26 |
| Elm Grove, | 681 | | 27 |
| Carbon, | 667 | | 28 |
| Mt. De Chantel, | 672 | | 30 |
| Wheeling, <i>North and Water Streets 645'. Market Place 662', . . .</i> | 645 | | 32 |

Elevations on Wheeling, Pittsburgh & Baltimore Branch of B. & O. RR. (formerly Hempfield RR.) were furnished by Mr. W. N. Bolling, Engineer B. & O. RR., as taken from original survey.

Datum: Mean tide at Baltimore, Md.

TABLE 183.

PITTSBURGH, FORT WAYNE AND CHICAGO RR.

| STATIONS. | + Lake Erie. | Ocean Level. | Ocean Level. | Dist. from Pittsburg. |
|---|--------------|-----------------|-----------------|--------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Pittsburgh, <i>Pittsburgh Union Depot, (See Ta- ble I,)</i> | 173.10 | 746 | 745 | 0 |
| Allegheny, | 165.82 | 739 | 738 | 1 |
| Outer Depot, | 191.85 | 765 | 764 | |
| Wood's Run, | 158.65 | 732 | 731 | |
| Jack's Run, | 156.50 | 729 | 728 | |
| Bellevue, | 156.50 | 729 | 728 | 5.4 |
| Emsworth, | 153.04 | 726 | 725 | 7 |

| | | | | |
|--|-------------------|---------|---------|-----|
| Dixmont, | 149.77 | 723 | 722 | 8.5 |
| Glendale, | 149.30 | 722 | 721 | 9.4 |
| Haysville, | 149.30 | 722 | 721 | |
| Sewickley, | 164.30 | 737 | 736 | |
| Edgeworth, | 152.80 | 726 | 725 | |
| Leetsdale, | 143.44 | 716 | 715 | |
| Fair Oaks, | 143.44 | 716 | 715 | |
| Economy, | 143.44 | 716 | 715 | |
| Economy Switch, | 143.44 | 716 | 715 | |
| Baden, | 138.24 | 711 | 710 | |
| Remington, | 138.24 | 711 | 710 | |
| Freedom, | 130.94 | 704 | 703 | |
| Rochester, <i>Junction with Cleveland and Pitts- burgh, (See Table 185,)</i> | 134.24 | 707 | 706 | |
| New Brighton, | 178.12 | 751 | 750 | |
| Beaver Falls, | 198.83 | 772 | 771 | |
| Sullivan, | 293.15 | 866 | 865 | |
| Wallace Run, | 322.84 | 896 | 895 | |
| Homewood, <i>New Castle and Beaver Valley Rail- road (See Table 188,)</i> | 376.76 | 950 | 949 | |
| Highland, | 471.28 | 1044 | 1043 | |
| Summit Cut, | 481.71 | 1055 | 1054 | |
| Darlington, | 403.85 | 982 | 981 | |
| New Gallilee, | 385.29 | 953 | 957 | |
| Enon, <i>From here on eleva- tions in this column are taken from the Geol. Survey of Ohio, Vol. 1, 1873,</i> | 434 | | | |
| State Line, | 472 | | | |
| Palestine, | 455 | | | |
| Leslie's Run, | 479 | | | |
| New Waterford, | 503 $\frac{1}{2}$ | | | |
| Bull Creek, | 515 $\frac{1}{2}$ | | | |
| Columbiana, | 555 | | | |
| Leetonia, | 541.09 | 1114 | 1113 | |
| Mill Creek, | 444.48 | 1017.56 | 1016.56 | |
| Beaver Creek, | 534 | | | |
| Green Creek, | 487 $\frac{1}{2}$ | | | |
| Gr. Cr. Siding, | 461 | | | |
| Middle York, | 454 | | | |
| Franklin, | 461 | | | |
| | 506 | | | |

Levels of Pittsburgh, Fort Wayne and Chicago RR. were copied from the profile (in the office at Pittsburgh) furnished through the kindness of Mr. F. Slataper, Chief Engineer.

Datum: Lake Erie. Accepted level of Lake Erie above Ocean level is 573'.

The third column subtracts 1' to reduce the levels of the second columns to harmony with those of the Pennsylvania RR.

It is thus seen that the Depot at Pittsburgh is established from the Atlantic side and from the Lake Erie side, with a probable error of about one foot.

TABLE 184.
OHIO RIVER WATER LEVELS.

| STATIONS. | + Lake Erie. | Ocean Level. | |
|--|--------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Ohio River at Beaver, | 93 | 666 | |
| New Castle Pool, | 222 | 799 | |
| Conneaut Lake, | 509.50 | 1082.50 | |
| Franklin. <i>This datum is especially valuable in the final determination of the absolute level of the Allegheny Valley RR. system centering here. But the height of the RR. track above Allegheny River water at Franklin has not been obtained,</i> | 381.50 | 954.50 | |
| Allegheny River at Pittsburgh. <i>Mr. Gardner quotes from report of City Engineer, March 15, 1871, (page 655, Hayden's Report of 1873,) for Pittsburgh: Low water, City Datum, 699.20; High water, 1852, 729.88; High water, 1832, 732.95,</i> | 120.50 | 693.50 | |

Elevation of points above tide from report of Col. W. Milnor Roberts to Canal Commissioners, November, 1840.

TABLE 185.
CLEVELAND AND PITTSBURGH RR.

| STATIONS. | Above Lake Erie. | Above Lake Erie. | Above Tide. | Dist. from Roc'ester. |
|--|------------------|------------------|--------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Rochester, <i>Junction with Pitts., Ft. W. & Chicago RR. is at 350 feet from east end of bridge. At Rochester station of that road the elevation is 707.24, (See Table 183,)</i> | . . . | 137 | 710 | 0 |

| | | | | |
|--|-----|-----|------|------|
| Beaver, <i>At Beaver commences a series of levels taken from page 669, of Vol. I, Ohio Geology, 1873, (in 1st column,)</i> | 138 | 137 | 710 | 1 |
| Industry, | 125 | 128 | 701 | 8 |
| Smith's Ferry, | 125 | 126 | 699 | 14 |
| Ohio State Line, | | 133 | 706 | |
| Liverpool, | 120 | 120 | 693 | 18 |
| Wellsville, | 115 | 115 | 688 | 22.5 |
| Yellow Creek, | 121 | 121 | 694 | 25.5 |
| Hammondsville, | 115 | 115 | 688 | 29 |
| Salineville, | 306 | 306 | 879 | 37 |
| Yellow Creek Summit, | 543 | | 1116 | |
| Sandy Summit, | 612 | | 1185 | |
| Bayard, | 503 | | 1076 | 55 |
| Mahoning Summit, | 627 | | 1200 | |
| Alliance, | 516 | | 1086 | 67 |
| Beech Creek, (water,) | 446 | | 1019 | |
| Beech Creek (rail,) | 471 | | 1044 | |
| Limaville, | 525 | | 1098 | 72 |
| Atwater, | 560 | | 1133 | 75 |
| Summit in Atwater, | 603 | | 1176 | |
| Rootstown, | 550 | | 1123 | 82 |
| Ravenna Public Square, | 560 | | 1133 | |
| Ravenna Station, | 530 | | 1103 | 86 |
| P. & O. Canal, | 495 | | 1068 | |
| P. & O. Canal, rail on bridge, | 509 | | 1082 | |
| Cuyahoga River, water, | 456 | | 1023 | |
| Cuyahoga River, bridge, | 474 | | 1047 | |
| Hudson Village, | 547 | | 1120 | 98 |
| Hudson Station, | 480 | | 1053 | 104 |
| Macedonia, | 420 | | 993 | |
| Tinker's Creek, (below rail,) | 120 | | 693 | |
| Tinker's Creek, | 248 | | 821 | |
| Bedford, | 368 | | 941 | 110 |
| Mill Creek, | 210 | | 783 | |
| Newburg, | 224 | | 797 | 116 |
| Cleveland, Euclid Avenue, | 95 | | 668 | 121 |
| Cleveland Machine shop, | 56 | | 629 | 126 |

Levels of the Cleveland and Pittsburgh RR. were copied from profile in office of Mr. Isaiah Linton, Chief Engineer, Ravenna, Ohio.

Datum : Lake Erie ; 573' above Ocean level.

TABLE 186.
OHIO RIVER DIVISION C. & P. RR.

| STATIONS. | +L. Erie. | Ocean Level. | Dist. from Yellow C. |
|--|--------------|--------------|----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Yellow Creek, (as above,) down the west bank of the Ohio, | 121 | 694 | 0 |
| M'Coy's, | 111 | 684 | 5 |
| Elliottsville, | | | 7 |
| Sloan's, | 125 | 698 | 9 |
| Jeddo, | | | 10 |
| Brown's, | | | 11 |
| Steubenville, Junction with Pittsburgh, Cincinnati and St. Louis, (See Table 180,) | 90 | 663 | 17 |
| Mingo Junction, | | | 20 |
| Lagrange, | | | 23 |
| Rush Run, | | | 28 |
| Portland, | 90 | 663 | 30 |
| Yorkville, | | | 32 |
| Deep Run, | | | 33 |
| Martin's Ferry, | 86 | 659 | 37 |
| Bridgeport, Junction with Baltimore and Ohio RR., (See Table 145,) | | | 39 |
| Bellaire, Junction Central Div. Balt. and Ohio RR., (See Table 145,) | 82 | 635 | 43 |

TABLE 187.
BEAVER CITY LEVELS.

Bench Marks,

| | |
|---|-------------------------|
| 23 Cross-cut on door-sill of National Plow Company's building in Rochester, west door, river front, | <i>Feet.</i> 690.365 |
| 26 N. E. corner French and Quay's fire brick-works, main building, opposite Beaver station, on east end, top of rubble masonry. Cut on top of rock, with cross beside it, | 688.946 |
| 25 Cut and marked with a cross on a flat stone, 40 feet from foot of alluvial bank toward river, and opposite a point 50' west of west end of platform at Beaver station, | 670.348 |

The above levels were brought from Pittsburgh from a Bench, whose reference above mean tide was given by the City Engineer, as determined by the Pennsylvania RR. level.

Bench Marks in vicinity of Beaver, Pa., furnished by Mr. James Harper, County Surveyor, who received the information from notes of Mr. J. N. Hoag, U. S. Engineer.

TABLE 188.
NEW CASTLE AND BEAVER VALLEY RR.

| STATIONS. | Lake Erie. | Ocean level. |
|---|--------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Homewood, <i>Pittsburgh, Ft. Wayne and Chicago RR., (See Table 183,)</i> | 376.76 | 950 |
| Clinton, | 326.97 | 900 |
| Thompson's, | 286.53 | 860 |
| Wampum, | 228.44 | 801 |
| Newport, | 239.36 | 812 |
| Moravia, | 233.02 | 806 |
| Lawrence Junction, <i>Junction with Erie and Pittsburgh RR. at Lawrence. RR. track at this point 10' above water in river, (See Table 191,)</i> | 201.09 | 774 |
| Mahonington, | 216.04 | 789 |
| New Castle, <i>Junction with Erie and Pittsburgh Railroad, (See Table 191,)</i> | 230.29 | 803 |
| Covert's Mills, | 217 | 790 |
| Edenburg, | 229 | 802 |
| Seymour, | 224.3 | 797 |
| Hilltown, | 225.6 | 799 |
| Quakertown, | 244.2 | 817 |
| Lowell, | 252.8 | 826 |
| Nebo, | 266.5 | 839 |
| Struthers, | 263 | 836 |
| Haselton, | 257.9 | 831 |
| Youngstown, | 264.4 | 837 |
| Brier Hill, | 278.61 | 852 |
| Girard, | 294.9 | 868 |
| Niles, | 291.3 | 864 |
| Warren, | 301.8 | 875 |
| A. & G. W. RR., <i>Atlantic and Great Western RR., (See Table 196,)</i> | 320.5 | 893.5 |
| Champion, | 359.3 | 932 |
| Bristolville, | 354.4 | 927 |
| Oakfield, | 339.4 | 912 |
| Bloomfield, | 331.8 | 905 |
| Orwell, | 363.5 | 936.5 |

| | | |
|---|--------|-----|
| Rock Creek, | 273.2 | 846 |
| Eagleville, | 218.8 | 792 |
| Austenburg, | 242.0 | 815 |
| Munson Hill, | 295.1 | 868 |
| Ashtabula, | 115.04 | 683 |
| L. S. & M. S. RR. Crossing, <i>Lake Shore and Michigan Southern RR., (See Table 194),</i> | 72.69 | 646 |
| Ashtabula Harbor, | 7.09 | 580 |

Levels on the New Castle and Beaver Valley RR. were obtained at Pittsburgh, Pa., through the kindness of Mr. F. Slataper, Chief Engineer, (late survey,) Pennsylvania Company.

Datum: Lake Erie, 573' above Ocean level.

The New Castle and Beaver Valley RR. runs from Homewood to New Castle. The Lawrence RR. from Lawrence Junction to Youngstown, O., and the Ashtabula, Youngstown and Pittsburgh RR. from Youngstown, O., to Ashtabula, O.

TABLE 189.

BEAVER CO. COLLIERIES.

| STATIONS. | Above Lake Erie. | Above Ocean Level. |
|------------------------------------|---------------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| New Castle, | 220 | 793 |
| Brier Hill, (Mahoning Valley,) . . | 356 | 929 |
| Hottenburgh, Lower Vein, | 520 | 1093 |
| Sandy Lake, | 740 | 1313 |
| Sandy Lake, Lower Vein, | 540 | 1113 |
| Harrisville, | 806 | 1379 |
| Gillande Summit, | 576 | 1149 |
| Franklin, | 417 | 990 |
| Mercer, | 500 | 1073 |

Levels of Coal Beds and other points from report of W. G. Darley, Chief Engineer of New Castle and Franklin RR., October 7, 1864.

TABLE 190.
NEW CASTLE AND FRANKLIN RR.

| STATIONS. | + Lake Erie. | Ocean Level. | Dist. from New Castle. |
|--|--------------|--------------|---------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| New Castle, <i>Junction with New Castle and Beaver Valley RR., $\frac{1}{2}$ mile south of city, (See Table 183,)</i> | 220.50 | 793 | 0 |
| Eastbrook, | 333 | 906 | 5 |
| Graham's, | 334 | 907 | 7 |
| Wilmington, | 355 | 928 | 9 |
| Neshanock Falls, | 419 | 992 | 10 |
| Volante, | 452 | 1025 | 13 |
| Leesburg, | 472 | 1045 | 16 |
| Nelson, | 487 | 1060 | 15 |
| Hope Mills, | 534 | 1107 | |
| Mercer, | 524 | 1097 | 22 |
| S. & A. RR. crossing, <i>Junction with Shenango and Allegheny RR., (See Table 192,)</i> | 539 | 1112 | 23 |
| Turner's, | 564 | 1137 | 25 |
| Jackson Centre, | 684 | 1257 | 28 |
| Garvin, | 754 | 1327 | 30 |
| Summit, | 815 | 1388 | 32 |
| Coulson, | 704 | 1277 | 35 |
| Coal Branch Crossing, | 621 | 1194 | |
| Stoneboro', <i>Junc. with Franklin Division L. S. & M. S. RR., (See Table 193,)</i> | 598 | 1171 | 36 |

Levels of the New Castle and Franklin RR. were copied from a profile of the road furnished by Mr. A. Vandivoort, Supt.

Datum: Lake Erie, 573' above Ocean level.

TABLE 191.
ERIE AND PITTSBURGH RR.

| STATIONS. | + Lake Erie. | Ocean level. | Dist. from New Castle. |
|--|--------------|--------------|---------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles</i> |
| New Castle, <i>Junction with New Castle Branch of Pittsburgh, Fort Wayne and Chicago RR., (See Table 183,)</i> | 236 | 809 | 0 |
| Harbor Bridge, | 243 | 816 | 4 |

| | | | |
|---|-------|-------|------|
| Nashua, | 248 | 821 | |
| Pulaski, | 253 | 826 | 11 |
| Middlesex, | 260 | 833 | 15 |
| Wheatland, | 268 | 841 | 18 |
| Sharon, | 280 | 853 | 21 |
| Sharpsville, | 375 | 948 | 24 |
| Clarksville, | 321 | 894 | 27 |
| Transfer, | 417 | 990 | 30 |
| A. & G. W. RR. Crossing, <i>Crossing of A. & G. W. RR.,</i> <i>(See Table 196,)</i> | 357 | 930 | 33 |
| Shenango, | 368 | 941 | 34 |
| Greenville, | 388 | 961 | 35.5 |
| Jamestown, <i>Crossing, Frank-</i> <i>lin Division, L. S. & M. S.</i> <i>RR., (See Table 193,)</i> | 406 | 979 | 42 |
| Kasson's, | 538 | 1111 | 49 |
| Espyville, | 515 | 1088 | 51 |
| Linesville, | 460 | 1033 | 55 |
| Summit Station. <i>The eleva-</i> <i>tion given at a point near</i> <i>Summit is 573' above Lake</i> <i>Erie = 1146' above Ocean</i> <i>level,</i> | 568 | 1141 | 59 |
| Conneautville, | 493 | 1066 | 63 |
| Spring, | 388 | 961 | 66 |
| Albion, | 284 | 857 | 72 |
| Crosses, | 192 | 765 | 78 |
| Girard Junction, <i>Junction with</i> <i>L. S. & M. S. RR, near Gi-</i> <i>rard. The levels from this</i> <i>point to Erie are same as in</i> <i>Table 194,</i> | 124 | 697 | 83 |
| Fairview, | 162 | 735 | 87 |
| Swansville, | 162 | 735 | 90 |
| Erie, <i>(See Table 194,)</i> | 112.5 | 685.5 | 98 |

Levels on the Erie and Pittsburgh RR. were copied from the profile in the office at Erie, through the kindness of Mr. E. N. Beebout, Asst. Engineer, at Ashtabula, Ohio.

Datum: Lake Erie, 573' above Ocean level.

TABLE 192.
SHENANGO AND ALLEGHENY RR.

| STATIONS. | + Lake Erie. | Ocean level. | Dist. from Harrisville. |
|---|--------------|--------------|-------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Harrisville, | 767 | 1340 | 0 |
| Pinegrove, | 677 | 1250 | 6 |
| Pardoe, | 632 | 1205 | 11 |
| Mercer, | 535 | 1108 | 16 |
| Cool Spring, | 554 | 1127 | 20 |
| Freedonia, | 604 | 1177 | 23 |
| New Hamburg, | 585 | 1158 | 26 |
| Shenango, | 364 | 937 | 31 |
| Greenville, <i>The Shenango and Allegheny RR. connects with the Erie & Pittsburgh RR. at Greenville, (See Table 191,)</i> | 388 | 961 | 33 |

Levels on the Shenango and Allegheny RR. were furnished through the kindness of Mr. Aug. Mordecai, Assistant Engineer A. & G. W. Railway, Meadville, Pa.

Datum: Lake Erie, 573' above Ocean level.

TABLE 193.
FRANKLIN DIVISION.
(*Lake Shore and Michigan Southern R.R.*)

| STATIONS. | + Lake Erie. | Ocean level. | Dist. from Oil City. |
|---|--------------|--------------|----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Oil City, east, <i>Connects with Allegheny Valley R.R., (See Table 164,)</i> | 436.80 | 1010 | 0 |
| Oil City, <i>Connects with Pittsburgh, Titusville and Buffalo R.R., (See Tables 171, 172, 173,) and with Franklin Branch of the Atlantic and Great Western R.R., (See Table 193,)</i> | 436.80 | 1010 | |
| Reno, <i>Connects with Franklin Branch of the Atlantic and Great Western R.R., (See Table 193,)</i> | 444.50 | 1017 | 4 |
| Two Mile Run, | 422.00 | 995 | |

| | | | |
|---|--------|------|----|
| Franklin, <i>Connects with Franklin Branch of the Atlantic and Great Western RR. (See Table 198,)</i> | 444.06 | 1017 | 8 |
| Midway, | 423 | 996 | |
| Summit, | 592.02 | 1165 | |
| Polk, | 511.07 | 1084 | 17 |
| Raymilton, | 564.88 | 1138 | 21 |
| Midway, | 600.88 | 1174 | |
| Naples, | 591.78 | 1165 | |
| Stoneboro, | 598.08 | 1171 | 29 |
| Coal Branch, | 626.08 | 1199 | |
| Clark's, | 591.30 | 1164 | |
| Hadley's, | 497.09 | 1070 | 38 |
| Salem, | 424.51 | 998 | 43 |
| A. & G. W. RR. Crossing, <i>Crossing Atlantic and Great Western RR. near Salem, (See Table 196,)</i> | 414 | 987 | |
| Midway, | 510.00 | 1083 | |
| Jamestown, <i>Crossing Erie and Pittsburgh RR., (See Table 191,)</i> | 416.78 | 990 | 50 |
| Turner, | 487.37 | 1060 | |
| Simond's, | 483.72 | 1057 | 56 |
| Andover, | 522.20 | 1095 | 62 |
| Richmond, | 540.71 | 1114 | |
| Dorsett, | 414.78 | 988 | |
| Jefferson, | 368.07 | 941 | 75 |
| Plymouth, | 281.20 | 854 | |
| Ashtabula, <i>Junction with main line of L. S. & M. S. RR. (See Table 194,)</i> | 74.52 | 648 | |

Levels on Franklin Division of Lake Shore and Michigan Southern RR. were copied from the profile in the office of the company at Cleveland, Ohio, by permission of Mr. J. D. Hawks, Asst. Engineer.

Datum: Lake Erie, 573' above Ocean level.

TABLE 194.

LAKE SHORE AND MICHIGAN SOUTHERN RR.

| STATIONS. | + Lake Erie. | Ocean Level. | Dist. from Buffalo. |
|---|--------------|--------------|---------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Buffalo, (<i>See Tables 99, 104, 175,</i>) | 9.3 | 582 | 0 |
| Hamburg, | 61.22 | 634 | 10 |
| Lake View, | 135 20 | 708 | 14 |
| Angolo, | 113 | 686 | 21 |
| Farnham, | 49.7 | 623 | 26 |
| Irving, | 12.9 | 586 | 29 |
| Silver Creek, | 48.96 | 622 | 31 |
| Sheridan, | 90.70 | 664 | |
| Dunkirk, <i>Connects at Dunkirk with N. Y. and Erie RR., (Table 98,) and with the Dunkirk, Allegheny Valley and Pittsburgh RR. (See Table 176,)</i> | 24.94 | 598 | 40 |
| Morian's, | 53.15 | 626 | 44 |
| Brocton, <i>connects at Brocton with the Buffalo, Corry and Pittsburgh RR. (See Table 179,)</i> | 115.11 | 688 | 49 |
| Portland, | 121.24 | 694 | |
| Westfield, | 123.66 | 697 | 57 |
| Ripley Crossing, | 163 | 736 | |
| Ripley, | 176.58 | 750 | 65 |
| State Line, | 212.18 | 785 | 68 |
| Northeast, | 231.4 | 804 | 73 |
| Moorhead's, | 194.6 | 768 | 77 |
| Harbor Creek, | 157 | 730 | 80 |
| Wesleyville, | 123.55 | 697 | 84 |
| Erie, <i>connects at Erie with Philadelphia and Erie RR. (See Table 129),</i> | 112.5 | 686 | 88 |
| Swanville, | 162 | 735 | 96 |
| Fairview, | 162 | 735 | 98 |
| Girard, <i>connects at Girard with the Erie and Pittsburgh RR. (See Table 191),</i> | 143.72 | 717 | 103 |
| Springfield, | 90 | 663 | 108 |
| Conneaut, | 78 | 651 | 115 |
| Amboy, | 107.75 | 681 | |
| Kingsville, | 98.40 | 671 | 123 |
| Ashtabula, <i>Franklin Division diverges from the Main Line at Ashtabula. (See Table 193,)</i> | 74.52 | 648 | 128 |
| Saybrook, | 77 | 650 | 133 |
| Geneva, | 94.16 | 667 | 158 |

| | | | |
|------------------------|--------|-----|-----|
| Unionville, | 130.31 | 703 | 141 |
| Madison, | 141.33 | 714 | 143 |
| Perry, | 133.09 | 706 | 148 |
| Painesville, | 76 | 649 | 154 |
| Mentor, | 76.8 | 650 | 160 |
| Willoughby, | 61.8 | 635 | 164 |
| Wickliffe, | 33.7 | 607 | 169 |
| Euclid, | 53.7 | 627 | |
| Cleveland, | 10 | 583 | 183 |

Elevations on Lake Shore and Michigan Southern RR. were copied from the Profile of the road in the office of the Company at Cleveland, Ohio, by permission of Mr. J. D. Hawks, Assistant Engineer.

Datum : Lake Erie, 573' above Ocean level.

TABLE 195.

ERIE CITY LEVELS.

| STATIONS. | Above Lake Erie. | Ocean Level. | |
|---|---------------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Chestnut Street, at Second Street, (Lake Bluff), | 70 | 643 | |
| Chestnut and 26th Street, | 190 | 763 | |
| Water in Reservoir, City Water Works, | 235 | 808 | |

Elevations of points in the City of Erie, Pa., were furnished by Mr Irvin Camp, City Engineer.

Datum : Lake Erie, 573' above Ocean level.

TABLE 196.

ATLANTIC AND GREAT WESTERN RR.

| STATIONS. | + L. Erie. | Ocean Level. | Dist. from Salaman- ca. |
|--|--------------|--------------|-------------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Salamanca, N. Y., at eastern ter- minus of A. & G. W. RR., Hem- lock St., Junction with Erie RR., (See Table 98,) | 820 | 1393 | 0 |
| Bucktooth, | 803 | 1376 | 2 |
| Red House, | 780 | 1353 | 7 |
| Steamburg, | 831 | 1404 | 12 |
| Randolph, | 745 | 1318 | 18 |

| | | | |
|---|-----|------|-----|
| Waterboro, | 703 | 1276 | |
| Kennedy, | 691 | 1264 | 25 |
| Poland, | 696 | 1269 | |
| Levant Grade, crossing D. A. V. & P. R.R., (See Table 176,) . . | 694 | 1267 | |
| Jamestown, (See Table 175,) . . | 748 | 1321 | 34 |
| Ashville, | 783 | 1356 | 41 |
| Watts Flats, formerly known as Panama, | 883 | 1456 | 45 |
| Grant, | 864 | 1437 | 48 |
| N. Y. & Pa. State Line, | 895 | 1468 | |
| Bear Lake, Pa., formerly known as Freehold, | 977 | 1550 | 51 |
| Columbus, | 854 | 1427 | 58 |
| Corry, Grade Crossing Phila. & Erie R.R., (See Table 129,) . . | 855 | 1428 | |
| Corry Station, | 858 | 1431 | 61 |
| Corry, Grade Crossing Buffalo, Corry and Pittsburg R.R., (See Table 179,) | 870 | 1443 | |
| Concord, | 788 | 1361 | |
| Union City, | 728 | 1301 | 72 |
| Mill Village, | 643 | 1216 | 79 |
| Millers, Pa., | 596 | 1169 | 85 |
| Cambridge, Pa., | 590 | 1163 | 88 |
| Venango, Pa., | 590 | 1163 | 92 |
| Saegertown, | 543 | 1116 | 96 |
| Meadville, | 507 | 1080 | 102 |
| Franklin Brch. Junen., at head block of switch, (See Table 198,) . | 501 | 1074 | |
| Geneva, formerly Suttons, | 496 | 1069 | 110 |
| Evansburg, | 711 | 1284 | 116 |
| Adamsville, | 575 | 1148 | 121 |
| Sugar Grove, | 467 | 1040 | |
| Greenville, | 411 | 984 | 129 |
| Shenango, Grade Crossing She- nango & Allegheny R.R., (See Ta- ble 192,) | 363 | 936 | |
| Erie & Pittsburgh R.R. crossing, at grade, (See Table 191,) | 363 | 936 | |
| Transfer, formerly Clarksville, . . | 420 | 993 | 135 |
| Crawfords, at head block of switch. (No Station,) | 320 | 893 | |
| Orangeville, | 372 | 945 | 141 |
| Penna. and Ohio State Line, . . . | 372 | 945 | |
| Burghill, | 471 | 1044 | 145 |
| Johnson's Summit, short piece of level track on Summit, | 553 | 1126 | |
| Baconsburg, | 426 | 999 | |

| | | | |
|---|-----|-----|-----|
| Warren, | 327 | 900 | 162 |
| Leavittsburg, | 322 | 895 | 165 |
| Leavittsburg, <i>Crossing of main line and Mahoning Division,</i> (See Table 197,) | 334 | 907 | |

Levels on Atlantic and Great Western R.R. were copied from a profile in the Company's office, Meadville, Pa. Through the kindness of Mr. C. Latimer, Chief Engineer, and his assistant, Mr. C. D. Allis, the levels on the Atlantic and Great Western R.R. and branches have been revised and corrected, and there is now some good reason to believe that the elevations in above table are reliable. These elevations are from a survey made in 1873. "All points given are top of rail of main track opposite middle of Passenger Station Buildings, unless otherwise specially designated." Datum, Lake Erie, 573 feet above Ocean. This datum refers to the main line and all its branches.

CLEVELAND, OHIO, Oct. 5, 1876.

MR. CHAS. ALLEN.

Dear Sir: Your letter of the 2d inst. to Mr. Latimer, Chief Engr., for attention. I send you by this mail one of the copies of "Levels of Pennsylvania," as requested by you. I have examined the pages devoted to the A. & G. W. R.R. very carefully, and you will notice that the changes made are not few. Thinking you might not understand my pencil notes on the pages, I send you a sheet herewith, which I think will prove more intelligible. I am inclined to think that the elevations of this Road, as given in the book, must have been taken from a location profile, or other equally accurate source of information. The elevations sent herewith are from a survey made during 1873, and I think may be considered *quite* reliable, for the following reasons: 1. They were obtained by careful and accurate men. 2. In 1874, a second level line was run over nearly 100 miles of the road, and then abandoned, as there was very little difference found. 3. They are very near a mean of other levels of roads crossing us. For instance, the J. & F. Division of L. S. & M. S. R.R., crossing us near Greenville, Pa., report elevation of crossing as 414'. Our profile shows 409'. The E. & P. R.R., crossing us six miles west of the I. & F., give elevation of crossing 357'. Our profile shows 363'. Our levels, when connected with those of the Ohio Canals at Akron, Ohio, checked theirs within 2 feet. At Jamestown, N. Y., and Youngstown, Ohio, elevations taken in 1873, agree with those taken ten years previous, and through these two places the line is known to be where located, or where it was 10 or 11 years ago. Pardon me this long letter, but I wished to make things clear. If I can be of any further service to you, shall esteem it a pleasure.

Respectfully,

C. D. ALLIS.

TABLE 197.
MAHONING DIVISION A. & G. W. RR.

| STATIONS. | +Lake Erie. | Ocean level. | Dist. from Sharon. |
|--|----------------|--------------|-----------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Sharon, Pa., (<i>See Table 191,</i>) . . . | 286 | 859 | 0 |
| Pennsylvania and Ohio State Line, | 279 | 852 | |
| Hubbard, Ohio, | 364 | 937 | 7 |
| Doughtens, Ohio, | 400 | 973 | |
| Thorn Hill, Ohio, | 296 | 869 | |
| Youngstown, Ohio, | 290 | 863 | 15 |
| Brier Hill, Ohio, | 307 | 880 | |
| Girard, Ohio, | 292 | 865 | |
| Niles, <i> Junction with Niles & New Lisbon R.R., (See Table),</i> . . | 317 | 890 | 23 |
| Warren, <i>This station of Warren is distant 1½ miles from Warren, on the main line,</i> | 310 | 883 | 28 |
| Leavittsburg, | 322 | 895 | 31 |
| Leavittsburg, <i>Crossing A. & G. W. R.R., main line, (See Table 196,)</i> | 334 | 907 | |
| Phalanx, <i>formerly Braceville,</i> . . | 345 | 918 | |
| Mahoning, <i>formerly Windham,</i> . . | 370 | 943 | 40 |
| Garrettsville, | 446 | 1019 | 44 |
| Mantua, | 538 | 1111 | 51 |
| Aurora, | 531 | 1104 | 57 |
| Pond, | 470 | 1043 | |
| Solon, | 468 | 1041 | |
| Randall, <i>formerly Plank Road,</i> . . | 473 | 1046 | |
| Newburg, | 240 | 813 | 75 |
| Newburg, <i>Grade crossing Cleve- land & Pittsburgh R.R., (See Ta- ble 185,)</i> | 175 | 748 | |
| Cleveland, (<i>See Table 194,</i>) . . . | 24 | 597 | |
| Lake Erie, | 00 | 573 | 80 |

Levels on Mahoning Division A. & G. W. RR. are published as corrected by Mr. C. D. Allis, Assistant Engineer, and explained in letter at foot of Table 196.

TABLE 198.

FRANKLIN BRANCH A. & G. W. RR.

| STATIONS. | +Lake Erie. | Ocean Level. | Dist. from Junction. |
|--|----------------|--------------|-------------------------|
| | <i>Feet.</i> | <i>Feet.</i> | <i>Miles.</i> |
| Junction, with A. & G. W. RR., about 3 miles south-east from Meadville. Elevation at head- block of switch into main line, . | 501 | 1074 | 0 |
| Shaw's Landing, | 519 | 1092 | 3 |
| Cochranston, | 491 | 1064 | 8 |
| Carlton, formerly Evans' Bridge, . | 474 | 1047 | 11 |
| Utica, | 462 | 1035 | 16 |
| Sugar Creek, | 441 | 1014 | 21 |
| Franklin, At Franklin the Frank- lin Branch of L. S. & M. S. RR. crosses above or over the Frank- lin Branch of A. & G. W. RR. 20 feet, (See Table 193,) | 414 | 987 | 25 |
| Reno, | 438 | 1011 | 30 |
| Oil City, (See Tables 164, 172, 173,) . | 433 | 1006 | 33 |

Levels on Franklin Branch A. & G. W. RR. revised and corrected by
Mr. C. D. Allis, Assistant Engineer A. & G. W. RR.

TABLE 199.

SHARON BRANCH A. & G. W. RR.

| STATIONS. | +Lake Erie. | Ocean Level. | |
|--|----------------|--------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Junction, Junction with main line, A. & G. W. RR., near Sharon, . | 374 | 947 | |
| Sharon, | 286 | 859 | |

TABLE 200.
BROOKVILLE TO SHEFFIELD.
(Preliminary Survey.)

| LOCALITY OF STATIONS, &c. | Assumed Elevation. | Ocean Level. |
|--|-----------------------|--------------|
| | <i>Feet.</i> | <i>Feet.</i> |
| Craft's Summit, | 600 | 1768 |
| Thence southward, <i>top of north rail on Low Grade Div., A. V. R.R., Brookville, (See Table 166,)</i> | 65.599 | 1234.8 |
| Returning to Craft's Summit, thence north- ward, Water in Clarion River, Station 377+61, | 34.886 | 1203.0 |
| Hunt's Summit, Station 911, B. M., (Forest county,) | 559.952 | 1728.1 |
| Eldridge's Summit, Station 1086+45, (For- est county,) | 665.097 | 1838.2 |
| Tionesta Creek, Water Station 1820+ (For- est county,) | 133.683 | 1301.88 |
| Top of south rail, P. & E. R.R., Sheffield, Station 1987+17, (<i>See Table 129,)</i> . . . | 176.973 | 1345.1 |

Above elevations furnished by Mr. James Caldwell, C. E., Brookville, Jefferson County, Pa. "The survey was made in the winter, when there was two feet or more of snow on the ground. The work was preliminary. No test levels taken." Elevation at Brookville, on Bennett's Branch R.R., (see Table 166,) 1234.8 above ocean. Take elevation as above at Brookville, 1234.8—65.599=1168.20, and add this result (1168.20) to each elevation as given by Mr. Caldwell, for an approximation to ocean level.

TABLE 201.
MOUNTAIN SUMMIT LEVELS.

| SUMMITS. | Tide. | Ocean Level. |
|---|--------------|--------------|
| | <i>Feet.</i> | |
| Nescopeck, N. P. R.R., | 1635 | |
| Elk and West Creek, P. & E. R.R., . . . | 1677 | |
| Sugar Run Gap, | 2161 | |
| West of Olean, N. Y. & E. R.R., . . . | 1672 | |
| Blair's Gap, Allegheny Portage Railroad, | 2339 | |
| Wilson's Gap, B. & O. R.R., | 2620 | |
| Sand Patch, P. & C. R.R., <i>top of mountain at this point, 2467, . . .</i> | 2286 | |

| | | | |
|---|------|--|--|
| Clarion, P. & E. RR., | 1979 | | |
| Catawissa Extension of Little Schuylkill RR., | 1450 | | |
| Elmira, N. Y. & E. RR., | 1419 | | |
| Chambersburg and Pittsburgh, <i>summit between Chambersburg and Pittsburgh, on turnpike</i> , | 2547 | | |

Statement of elevations of Summits of dividing grounds of Eastern and Western Waters.

NOTE.—The above levels were copied by Mr. G. W. Leuffer from Mr. Strickland Kneass' memorandum, April 4, 1866, and are supposed by Mr. Leuffer to be from surveys made by Col. Charles H. Schlatter, in 1838 or 1839.

TABLE 202.
MISCELLANEOUS LEVELS.
(Late Survey, O. Barrett, Jr.)

| LOCALITY OF POINTS. | Above Mean Tide. |
|---|---------------------|
| | <i>Feet.</i> |
| Summit of Tussey's Mountain, <i>in road west of Saxton, Broad Top City</i> , | 1984 |
| Summit of Black Log Mountain, <i>4 miles south of Orbisonia</i> , | 1983 |
| Gap in Shade Mountain, <i>near Shade Gap P. O.</i> , | 1616 |
| Summit of Tuscarora Mountain, <i>in road between Shade Gap and Spring Run Village</i> , | 893 |
| Spring Run Village, <i>in Path Valley</i> , | 1926 |
| Conococheague Creek, <i>at or near John H. Witherow's store, foot of Knob Mountain</i> , | 877 |
| Summit of Kittatinny Mountain, <i>on road between Spring Run Village and Roxboro' Village</i> , | 828 |
| Couedogwinit Creek, <i>Gap in Kittatinny, or North Mountain</i> , | 1915 |
| Roxboro' Village, | 834 |
| | 782 |

Above levels furnished by Mr. O. Barrett, Jr., C. E., and are published for comparison with other tables. These elevations were established recently by Mr. Barrett, for the "Seaboard Pipe Line Co."

TABLE 203.
MISCELLANEOUS LEVELS.
(Col. James Worrall.)

| LOCALITY OF POINTS. | Referred to Tide. |
|--|-------------------|
| | <i>Feet.</i> |
| Landisburg, <i>Perry county, Pa.</i> , | 740 |
| Head of Liberty Valley, (Trap Dyke,) | 900 |
| Waterford, | 630 |
| Burnt Cabins, | 870 |
| Bedford, (<i>about</i>), | 1100 |
| Allegheny Mountain, <i>Somerset Pike</i> , | 2490 |
| Somerset, | 2300 |
| Laurel Hill, | 2495 |

The elevations of above points are furnished by Col. James Worrall, C. E., Harrisburg, Pa., who says: "Approximations to compare with others. If any one is found to be correct, they are all correct."

TABLE 204.
SEABOARD PIPE LINE.
(Through Indiana County.)

| STATIONS. | Trees, &c., Marked with White Paint. | Above Mean Tide. |
|-----------|--|------------------|
| | | <i>Feet.</i> |
| 1376.70 | In Armstrong Co. Land of J. Scott, $1\frac{1}{2}$ miles from Dayton, | 1481.9 |
| 1377.00 | Line of Armstrong and Indiana counties, | |
| 1378.35 | 6' right Chestnut Oak. On land of E. D. Sheffer. In woods, | 1474.00 |
| 1401.20 | 46' right Cucumber Tree. Land of J. L. Buterbaugh, | 1489.55 |
| 1419.25 | 8' left White Oak, edge of woods. Land of Samuel T. Fulton, | 1463.35 |
| 1429.15 | 11' right Apple Tree, in orchard, near dwelling of S. T. Fulton, | 1470.00 |
| 1442.90 | 92' right White Oak, near Public Road. Land of J. A. Wingrone, | 1461.20 |
| 1453.40 | 170' from Pin Oak. Smicksburg two miles north, | 1433.50 |
| 1481.90 | 80' right Wild Cherry. Land of Ephraim Ritchey, | 1387.75 |
| 1490.75 | 6' right White Oak. Land of Chris. Good, | 1403.00 |
| 1498.90 | 35' left Poplar. Land of Chris. Good, <i>Smicksburg, about two miles north</i> , | 1305.00 |
| 1515.50 | 15' right spring-house of Barnabas Lowe, | 1278.10 |

| | | |
|---------|---|---------|
| 1519.00 | 15' left Apple. Land of Mrs. Lena Lukehart, | |
| 1537.00 | 20' left White Oak "snag." Land of Mrs. Catharine Bowser, | 1313.30 |
| 1544.80 | 69' right White Oak. Land of Mrs. Catharine Bowser, | 1292.00 |
| 1558.40 | 90' left dead tree. Land of John Lewis, | 1315.95 |
| 1559.90 | 20' left fence stake. Land of John Lewis, | 1464.50 |
| 1561.30 | 52' right fence stake. Land of John Lewis. Between two pines, on high hill, very prominent point, | 1483.50 |
| 1570.75 | 9' right fence stake, 150' right dwelling of John Lewis, | 1480.70 |
| 1580.80 | 8' left fence stake. Land of Isaac Good. About 18 miles to Indiana and 20 miles to Kittanning from station 1580.80, | 1309.30 |
| 1589.95 | 4' right dead tree. Land of Isaac Good, | 1338.50 |
| 1599.20 | 19' right dead Wild Cherry. Land of David Elkin, | 1279.30 |
| 1604.65 | 37' left dead tree. Land of David Elkin, | 1350.10 |
| 1608.90 | 4' right White Oak. Edge woods. Land of James M. Wells, | 1300.30 |
| 1613.60 | 6' left Hickory. Edge woods. Land of James M. Wells, | 1246.60 |
| 1631.65 | 107' left Wild Cherry. Edge woods. Land of James M. Wells, | 1256.50 |
| 1638.30 | 50' right dead tree, | 1225.80 |
| 1642.80 | 16' left White Oak. Beginning of woods, | 1237.20 |
| 1652.05 | 12' right White Oak. In woods. Land of Robert L. Mabon, | 1231.80 |
| 1665.50 | 23' left White Oak. Edge of woods. Land of J. L. Mabon, | 1225.45 |
| 1669.60 | 138' left Hickory. Front of Mr. J. L. Mabon's dwelling, | 1219.90 |
| 1676.35 | 35' left White Oak, | 1221.20 |
| 1680.65 | 78' left Red Oak, | 1228.45 |
| 1684.20 | 8' left Maple, | 1279.60 |
| 1695.00 | Right of gate post, near Absalom Neff's barn, | 1276.70 |
| 1701.45 | 15' left White Oak. Land of Absalom Neff, | 1899.30 |
| 1717.70 | 9' right White Oak. In Public Road. Land of John Smith, | 1216.20 |
| 1725.45 | 28' right fence stake, between house and barn of Mr. Smith, | 1245.90 |
| 1727.55 | 32' left Ash, | 1314.00 |
| 1739.00 | 4' right Cucumber Tree, | 1313.50 |
| 1745.20 | 38' right Ash. Land of Allen Hamilton, | 1335.70 |
| | | 1372.90 |

| | | |
|---------|---|---------|
| 1757.20 | 73' left Hickory. Land of Mrs. Hannah F. Hamilton, | 1344.35 |
| 1762.85 | Right White Oak. <i>Smyrna Church</i> 900' north, | 1303.60 |
| 1776.90 | 15' left Gum. Land of Silas W. Brady, . | 1326.15 |
| 1781.50 | 6' left Pin Oak. In woods. Land of W. A. Hamilton, | 1395.50 |
| 1785.95 | 2' left fence stake. Land of Thomas Stuart, | 1321.20 |
| 1794.40 | 21' left White Oak, | 1316.40 |
| 1802.35 | 7' right Red Oak. Top hill in woods, . . | 1513.60 |
| 1819.00 | 55' right large White Oak. Land of James Hopkins. Near Public Road, | 1294.40 |
| 1847.30 | 6' left fence, near dwelling of Moses T. Work, | 1428.40 |
| 1868.70 | 15' right White Oak. In road. Land of E. I. Work, | 1277.80 |
| 1881.45 | 20' right Pin Oak. In road. Land of William I. Work, | 1341.30 |
| 1889.55 | 70' left Pine. Land of William I. Work, . | 1354.10 |
| 1898.40 | 4' right Pin Oak, in woods, | 1373.10 |
| 1910.90 | 10' left White Oak, edge woods. Land of Mr. Steffer, | 1349.00 |
| 1926.00 | 8' left White Oak. Land of Mr. Steffer, . | 1350.10 |
| 1932.15 | 6' left White Oak. Land of Abner Griffith, | 1271.40 |
| 1934.40 | 1' left fence stake, in Public Road, . . . | 1280.90 |
| 1950.50 | 53' right Locust. Land of William G. Stewart, | 1318.00 |
| 1970.90 | 4' left Chestnut. Land of Samuel Lewis. In woods, | 1347.80 |
| 1984.90 | 10' left Chestnut. Land of J. J. Williams. Edge woods, | 1463.90 |
| 1991.70 | 55' right Chestnut. In field. <i>Marion</i> , $\frac{3}{4}$ mile south, | 1493.90 |
| 2002.60 | 5' right White Oak. In woods. <i>Marion</i> , $\frac{3}{4}$ mile south, | 1411.60 |
| 2014.35 | 3' left fence stake. In field. Land of Levi Spencer, | 1534.40 |
| 2018.75 | 5' left Chestnut. In woods. Land of Levi Spencer, | 1549.10 |
| 2028.30 | 14' left White Oak. In clearing. Land of James Hunter, | 1486.90 |
| 2050.00 | 8' left dead tree in field. Land of James Hunter, | 1666.70 |
| 2057.10 | 4' right White Oak, in Public Road. Land of James Hunter, | 1693.70 |
| 2071.20 | 11' right dead tree. Land of Samuel Lewis. Fifteen miles to Indiana, . . . | 1627.20 |

| | | |
|---------|---|---------|
| 2079.85 | 55' right Hickory. Land of "Abe" Lowman, Jr., | 1631.70 |
| 2088.50 | 3' left Hickory. Land of Geo. Shrader, . | 1594.30 |
| 2100.05 | 8' left Maple in Public Road, | 1457.80 |
| 2113.45 | 5' right dead White Oak. Land of Lorenz Reithmiller, | 1471.50 |
| 2118.40 | 9' right Wagon Shed, near Reithmiller's buildings, | 1470.60 |
| 2125.75 | 4' left dead White Oak, | 1413.00 |
| 2140.20 | 3' left Hickory. Beginning woods, . . . | 1643.90 |
| 2153.50 | 9' right Lynn, in <i>new</i> Road. Land of Solomon Fullmer. In woods, | 1458.10 |
| 2155.15 | 15' right Beech, | 1424.00 |
| 2166.25 | 4' right Beech. In woods. Land of Kinter Heirs, | 1398.70 |
| 2167.00 | In Public Road, | |
| 2167.95 | 1' right Maple. In woods. Land of Kinter Heirs, | 1399.10 |
| 2201.60 | 11' left Gum. In woods. Land of W. N. Barr, | 1588.10 |
| 2206.00 | 1' left dead tree. Out of woods, | 1647.80 |
| 2215.60 | 34' left Cucumber Tree. On land of Mrs. Eliza Rice. Mrs. Rice's buildings to the right, | 1591.00 |
| 2217.25 | In Public Road. Fourteen miles to Indiana, | 1587.00 |
| 2223.60 | 1' right small dead Chestnut. Beginning woods, | 1643.80 |
| 2233.95 | 8' right Maple. In woods, | 1624.10 |
| 2240.00 | 13' right White Oak. In woods. Land of Joseph Ober, | 1527.80 |
| 2242.35 | 6' left small White Oak, | 1515.90 |
| 2250.90 | 16' right "Snag," | 1620.60 |
| 2256.90 | 7' left Chestnut. In woods, | 1640.10 |
| 2262.00 | 46' left dead White Oak. Out woods, . . | 1628.00 |
| 2266.75 | 50' right Stump. Land of Moses and William Lydick, | 1586.20 |
| 2278.20 | 4' left "Big" White Pine, | 1575.20 |
| 2284.90 | 9' left Poplar. Beginning of woods, . . | 1599.40 |
| 2297.15 | 8' left White Pine in Public Road, on land of Jacob Fyock, | 1621.60 |
| 2302.25 | In cross-roads. Dunkard Church close to the left, | |
| 2307.45 | 15' left White Oak. In Public Road, . | 1643.90 |
| 2314.90 | 11' left Gum. In Public Road, | 1665.10 |
| 2333.75 | 5' right Chestnut. Land of Geo. Wise. In Public Road, | 1653.00 |
| 2338.55 | 10' left fence post. Solomon Wise's buildings to the right, | 1625.00 |

| | | |
|---------|---|---------|
| 2354.00 | 13' left dead White Oak. Land of Mr. Mumma, | 1556.50 |
| 2363.75 | 3' right White Oak. Mrs. Cath. Barr's dwelling to the right, | 1486.20 |
| 2368.50 | 11' right Pine, | 1446.50 |
| 2382.50 | 16' right Apple Tree. Land of John Buterbaugh, | 1427.70 |
| 2393.80 | 4' right dead Pine. Mills and Dam to the right, | 1442.00 |
| 2405.30 | 15' left dead White Oak, | 1395.00 |
| 2417.50 | 14' left dead White Pine. Land of Mrs. J. H. Stumpf, | 1430.90 |
| 2430.35 | 4' left dead Pine in clearing. Land of Solomon Buterbaugh, | 1535.20 |
| 2433.45 | 11' right White Oak, near Public Road, | 1539.70 |
| 2450.45 | 73' left Pine "Snag," | 1606.90 |
| 2457.45 | 56' left large Maple. Land of William H. Lutman, | 1584.80 |
| 2469.35 | 16' left White Pine. Back of Lutman's buildings, | 1581.30 |
| 2480.30 | 4' left Red Oak. On land of Mrs. McCullagh, | 1576.40 |
| 2481.75 | In Public Road, near old Planing Mill. Cookport $\frac{1}{2}$ mile to the south, | |
| 2487.30 | 6' right Chestnut. Land of Rich'd Cook, | 1578.00 |
| 2498.00 | 1' right Chestnut. In woods, | 1555.30 |
| 2515.85 | 2' right Pine. In Public Road, | 1574.70 |
| 2523.10 | 4' left Pine. In Public Road, | 1559.60 |
| 2536.50 | 3' left Pine. In Public Road. Land of George Baker, | 1549.20 |
| 2553.50 | 11' right Stump. In Public Road, | 1614.20 |
| 2559.40 | 16' right fence. In Public Road. Land of Peter Leasure, | 1604.70 |
| 2561.75 | Peter Leasure's buildings on both sides of road, | |
| 2562.85 | 15' left Balm of Gilead. Public Road, | 1580.40 |
| 2572.15 | 12' right Pine. Public Road, | 1574.80 |
| 2584.60 | 6' right Hemlock. Public Road, | 1517.80 |
| 2589.20 | Compton's Saw Mill and Dam, | |
| 2592.30 | 17' right small Pine, | 1438.80 |
| 2595.45 | Right Red Oak, in woods, | 1486.30 |
| 2603.30 | 4' left Hemlock, in woods, | 1570.50 |
| 2610.10 | 6' left Hemlock, in woods. In wood road, | 1512.20 |
| 2614.00 | 9' left Hemlock, in woods, | 1467.90 |
| 2621.95 | 3' left Hemlock, in woods, | 1619.20 |
| 2626.15 | 20' left Maple, near Public Road. Spruce P. O. $\frac{1}{2}$ mile north, Cherry Tree $5\frac{1}{2}$ miles north. Indiana $16\frac{1}{2}$ miles southwest, | 1638.40 |

| | | |
|---------|--|---------|
| 2628.25 | 4' right Hemlock. In woods, | 1626.70 |
| 2638.30 | 3' right White Oak. In woods, | 1527.00 |
| 2640.15 | Two Lick Creek at Repine's old Saw Mill, | 1510.00 |
| 2642.95 | 9' right Maple. Land of J. C. Repine, . . | 1528.70 |
| 2655.15 | 8' right Stump. Land of Thomas Patter- son, | 1680.10 |
| 2661.00 | Public Road. Church to left, | |
| 2664.50 | Patterson's buildings to left, | |
| 2666.34 | 4' right Chestnut, | 1671.40 |
| 2676.20 | 7' right Chestnut. Land of J. C. Lea- sure, | 1736.20 |
| 2683.45 | 28' left Chestnut. In road and in woods, | 1869.10 |
| 2691.50 | 1' right Chestnut Oak. In woods. Land of Thomas McDowell, | 1920.30 |
| 2701.05 | 9' left Chestnut Oak. Land of Robert Pershing, | 1974.80 |
| 2705.20 | 28' right fence post, | 1956.70 |
| 2707.50 | Pershing's buildings close to left, | |
| 2710.20 | 4' left fence stake, | 1946.60 |
| 2714.60 | 5' right Chestnut Oak, | 1972.20 |
| 2719.55 | 1' left fence stake in Public Road, | 1963.30 |
| 2722.90 | 20' right Hickory. Land of J. T. Thomas, Sr., | 1940.60 |
| 2729.00 | 17' right Chestnut. Land of O. J. Wil- liams, | 1906.00 |
| 2739.65 | 5' right Chestnut Oak. Land of David Martin, | 1965.30 |
| 2745.55 | 8' left Stump. <i>High point.</i> Divide be- tween Alleghany and Susquehanna waters, | 1999.20 |
| 2751.00 | 19' right Stump, | 1991.40 |
| 2752.00 | D. Martin's buildings to right, | |
| 2762.25 | 6' right Stump. In Public Road. Mar- tin's store to right. 18 miles to In- diana. 16 miles to Ebensburg, | 1970.80 |
| 2770.80 | 30' right dead Pine. Land of J. Martin, | 1941.90 |
| 2774.25 | 8' right Hickory. Land of Mrs. Nancy Keith, | 1905.70 |
| 2779.70 | 2' left Beech. Beginning of woods, | 1848.30 |
| 2781.65 | 4' left Beech. Land of J. Martin. In woods. On waters of Dutch Run, flow- ing into the Black Lick, | 1843.90 |
| 2786.55 | 4' right Pine. <i>About</i> the line between Indiana and Cambria counties, | 1830.20 |
| 2790.65 | 4' left Hemlock, | 1825.30 |

The whole of the stations are not given, as I thought it not necessary.

The stations "run" by hundreds of feet and the decimals of a hundred feet. Station 2790.65 would read: Two hundred and seventy-nine thousand and sixty-five feet; or, 52.85 miles.

O. BARRETT, Jr.

NOTE.—The above notes were communicated by Mr. O. Barrett, Jr., assistant in charge of the survey of the Western Division of the Seaboard Pipe Line, and by permission of Gen. Hermann Haupt, Chief Engineer.

The table was read at a meeting of the American Philosophical Society, October 5, 1877, and published in the proceedings, Vol. XVII, page 145.

TABLE 205.

SEABOARD PIPE LINE.

(From the Allegheny River to Baltimore.)

| △ | Elev. | Cour. | Dist. | MAXIMA. | | MINIMA. | | |
|--------|---------|---|-------|--|--------|---------|--------|---|
| | | | | △ | Elev. | △ | Elev. | |
| B M | 807.45 | Elevation of surface of water in Allegheny River at mouth of Black Fox Run. | | | | | | |
| 0.00 | 824.20 | 87 $\frac{0}{2}$ | 9155 | 39.30 | 1143.2 | 50.90 | 1110.6 | Entrance to McElroy's Coal Mine. Creek. |
| 98.35 | 1231.8 | 118 $\frac{0}{2}$ | 20010 | 91.90 | 1343.6 | | | |
| | | | | 121.00 | 1500.1 | 127.80 | 1445.9 | Catfish Run. |
| | | | | 132.45 | 1496.7 | 168.00 | 1210.0 | |
| | | | | 170.95 | 1222.3 | 178.95 | 1218.6 | |
| | | | | 184.45 | 1219.1 | 204.25 | 1100.0 | |
| | | | | 211.90 | 1212.8 | 215.10 | 1209.7 | |
| | | | | 218.15 | 1212.8 | 227.50 | 1185.0 | Catfish Run. New Athens. |
| | | | | 235.80 | 1222.2 | 242.00 | 1184.0 | |
| | | | | 246.10 | 1210.0 | 250.15 | 1198.6 | |
| | | | | 266.15 | 1252.9 | 270.50 | 1235.0 | |
| | | | | 283.80 | 1290.1 | 294.70 | 1271.0 | |
| | | | | $\frac{1}{4}$ mile to right. | | | | |
| 315.70 | 1420.00 | 128 $\frac{0}{2}$ | 39230 | 314.05 | 1436.8 | 321.50 | 1280.0 | Small Run. |
| | | | | 331.60 | 1413.8 | 337.10 | 1290.0 | |
| | | | | 346.90 | 1419.0 | 354.75 | 1350.0 | |
| | | | | 360.50 | 1410.7 | 368.10 | 1273.0 | |
| | | | | 378.85 | 1368.6 | 389.00 | 1146.0 | |
| | | | | 390.90 | 1182.5 | 408.15 | 1049.7 | Turkey Run. ditto. ditto. Red Bank Creek. |
| | | | | 418.35 | 1092.5 | 439.60 | 946.0 | |
| | | | | 441.50 | 984.7 | 445.30 | 923.4 | |
| | | | | 450.55 | 949.3 | 456.85 | 848.0 | |
| | | | | 461.00 | | 461.00 | 839.0 | |
| | | | | Line between Clarion and Armstrong Counties. | | | | |
| | | | | 488.00 | 1219.6 | 495.20 | 1083.0 | Creek. Run. Creek. Br. of Mahoning Cr. |
| | | | | 504.05 | 1222.9 | 509.80 | 1158.0 | |
| | | | | 518.85 | 1352.3 | 526.50 | 1280.0 | |
| | | | | 539.40 | 1384.1 | 557.00 | 1055.0 | |
| | | | | 566.65 | 1375.6 | 574.00 | 1198 | |
| | | | | 674.55 | 1525.4 | 687.40 | 1356 | |
| | | | | 694.30 | 1448.0 | 701.35 | 1275 | |
| | | | | 707.50 | 1352.0 | 730.45 | 997.0 | |

| | | | | | | | | |
|---------|--------|---------|--------|---------|--------|---------------|--------|----------------------|
| 731.75 | 1038.5 | 126.05' | 31030' | 736.15 | 1205.6 | 740.10 | 1090.0 | Creek. |
| | | | | 762.95 | 1376.0 | 784.00 | 1125.0 | Creek. |
| | | | | 811.50 | 1309.0 | 824.00 | 794.5 | Mahoning Creek. |
| | | | | 926.75 | 1450.9 | | | to |
| | | | | 1011.05 | 1493.0 | 1025.40 | 1276 | |
| | | | | 1033.50 | 1352.0 | | | |
| 1044.60 | 1290.0 | 102.45' | 16430' | 1078.90 | 1505.6 | 1095.60 | 1457.1 | |
| | | | | 1098.80 | 1540.0 | 1130.50 | 1371.0 | |
| | | | | 1159.90 | 1550.0 | 1227.65 | 1329.0 | |
| 1214.10 | 1401.0 | 116.10' | 18640' | 1247.50 | 1413.0 | 1260.90 | 1303.0 | |
| | | | | 1266.35 | 1384.0 | 1270.75 | 1257.0 | Glade Run. |
| | | | | 1304.30 | 1350.0 | 1323.40 | 1255.0 | |
| | | | | 1346.55 | 1405.0 | 1359.90 | 1287.0 | Spring Run. |
| | | | | 1377.00 | 1460 | Line of Arm | | strong and Ind. Cos. |
| 1407.10 | 1400.0 | 129.35' | 42860' | 1387.75 | 1495 | 1411.00 | 1394 | |
| | | | | 1422.70 | 1468.0 | 1460.00 | 1345 | |
| | | | | 1467.00 | 1372.0 | 1473.00 | 1286 | Run. |
| | | | | 1486.80 | 1406.0 | 1502.30 | 1257 | |
| | | | | 1507.60 | 1265.0 | 1511.00 | 1247 | Run. |
| | | | | 1521.30 | 1203.0 | 1530.35 | 1230.0 | |
| | | | | 1537.00 | 1279.0 | 1540.25 | 1187.0 | Run. |
| | | | | 1547.00 | 1351.0 | 1552.80 | 1365.0 | |
| | | | | 1561.30 | 1469.0 | 1571.25 | 1285.0 | |
| | | | | 1577.60 | 1365.0 | 1586.50 | 1193.0 | |
| | | | | 1599.20 | 1337.0 | 1610.40 | 1224.0 | |
| | | | | 1615.25 | 1247.0 | 1625.50 | 1201.0 | |
| | | | | 1638.30 | 1224.0 | 1663.70 | 1208.0 | |
| | | | | 1682.55 | 1274.0 | 1686.00 | 1214.0 | |
| | | | | 1690.40 | 1322.0 | 1692.30 | 1173.0 | |
| | | | | 1725.20 | 1301.0 | 1735.75 | 1270.0 | |
| | | | | 1745.20 | 1358.0 | 1749.70 | 1238.0 | |
| | | | | 1757.20 | 1331.0 | 1771.00 | 1227.0 | |
| | | | | 1781.00 | 1383.0 | 1785.00 | 1295.0 | |
| | | | | 1789.80 | 1344.0 | 1794.40 | 1303.0 | |
| 1842.80 | 1400.0 | 121.10' | 32090' | 1802.35 | 1500.0 | 1817.75 | 1259.0 | Run. |
| | | | | 1847.30 | 1415.0 | 1863.15 | 1253.0 | |
| | | | | 1881.45 | 1328.0 | 1885.00 | 1289.0 | |
| | | | | 1898.40 | 1360.0 | 1903.55 | 1328.6 | |
| | | | | 1911.20 | 1336.0 | 1917.00 | 1260.0 | |
| | | | | 1924.00 | 1341.0 | 1931.00 | 1246.0 | |
| | | | | 1950.50 | 1295.0 | 1955.00 | 1277.0 | |
| | | | | 1989.65 | 1484.0 | 2002.60 | 1399.0 | |
| | | | | 2018.75 | 1536.0 | 2030.80 | 1467.0 | |
| | | | | 2057.30 | 1680.0 | 2073.75 | 1595.0 | |
| | | | | 2078.15 | 1621.0 | 2108.10 | 1441.0 | |
| | | | | 2114.50 | 1468.0 | 2126.50 | 1392 | Creek 10' wide. |
| | | | | 2142.95 | 1635 | 2156.10 | 1425 | |
| 2182.90 | 1480 | 119.25' | 11390' | 2159.00 | 1463 | 2165.35 | 1384 | Two Lick Creek. |
| | | | | 2206.80 | 1638 | 2217.25 | 1574 | |
| | | | | 2228.25 | 1638 | 2241.15 | 1500 | Run 4' wide. |
| | | | | 2253.80 | 1628 | 2264.75 | 1555 | |
| | | | | 2272.00 | 1611 | 2275.30 | 1553 | |
| | | | | 2281.95 | 1590 | 2290.30 | 1572 | Run. |
| 2297.15 | 1609 | 169.40' | 6540' | 2319.80 | 1671.5 | Divide of Two | | Lick and Mahoning |
| 2368.50 | 1433.5 | 124.10' | 20690' | 2376.15 | 1440 | 2372.60 | 1380 | Run. [Creeks. |
| | | | | 2450.45 | 1593 | 2407.30 | 1374 | Br. of Two Lick c'k. |
| | | | | 2556.00 | 1607 | 2504.80 | 1527 | |
| 2579.60 | 1544.7 | 156.10' | 16520' | 2603.30 | 1557.5 | 2521.90 | 1421 | |
| | | | | 2626.15 | 1625 | 2613.00 | 1442 | Creek. |
| | | | | 2652.95 | 1666 | 2640.15 | 1497 | |
| | | | | 2701.05 | 1962 | 2661.00 | 1612 | |
| | | | | 2714.60 | 1959 | 2710.20 | 1934 | |
| | | | | | | 2732.00 | 1870 | Creek. |

236 N. REPORT OF PROGRESS. CHARLES ALLEN.

| | | | | | | |
|---------|--------|--------|-------|-------------------|----------------|---------------------|
| 2751.00 | 1978 | 129.45 | 32020 | 2745.55 1986 | 2781.65 1831 | Run. |
| | | | | 2804.45 1811 | 2808.50 1786 | |
| | | | | 2818.40 1858 | 2833.55 1807 | Creek. |
| | | | | 2851.70 1894 | 2860.00 1868 | |
| | | | | 2882.35 1896 | 2909.00 1898 | Spring. |
| | | | | 3019.30 2014 | 3027.00 1984 | |
| | | | | 3066.95 2096 | | |
| 3075.80 | 2055.0 | 107.40 | 13820 | 3143.55 2144 | 3081.00 2005 | |
| | | | | 3171.70 2099 | 3165.70 2015 | |
| | | | | 3200.25 2118 | 3187.75 2083 | |
| 3220.15 | 2060.9 | 102.50 | 10830 | 3233.50 2090 | 3214.30 2015 | |
| | | | | 3277.75 2131 | 3267.30 2036 | |
| 3324.10 | 1855 | 127.30 | 6610 | nearly lev el. | 3369.10 1766 | Creek. |
| | | | | | 3380.00 1757 | Same Creek. |
| | | | | | 3398.50 1752 | Laurel Run. |
| | | | | | 3406.00 1751 | Chestnut Creek. |
| | | | | 3414.30 1880 | 3422.00 1754 | Run. |
| | | | | 3456.30 1981 | 3473.40 1814.0 | Run. |
| | | | | 3494.00 1917 | 3500.20 1825 | Run. |
| | | | | 3505.60 1876 | 3514.75 1747 | Run. |
| 3515.00 | 1747.3 | 88.35 | 8480 | | 3515.75 1744 | Same Run. |
| | | | | 3522.40 1765 | 3524.00 1761 | |
| | | | | 3532.45 1990 | 3550.30 1708 | Run. |
| | | | | level. | 3565.75 1687 | Creek. |
| | | | | 3581.05 1875 | 3594.75 1722 | Creek. |
| | | | | 3606.65 1877 | | |
| 3607.90 | 1859.3 | 105.30 | 12510 | | 3615.40 1778 | |
| | | | | 3630.85 1868 | 3640.30 1785 | Creek. |
| | | | | 3657.15 1868 | 3669.00 1798 | Creek. |
| | | | | | 3699.00 1600 | Clearfield Creek. |
| 3741.30 | 1808.5 | 72.35 | 8430 | 3765.10 2030 | 3773.75 1961 | |
| | | | | 3796.85 2140 | 3804.80 2108 | |
| | | | | 3824.50 2185 | | |
| 3826.60 | 2180 | 65.30 | 7980 | 3828.25 2194 | 3843.30 1910 | Laurel Run. |
| | | | | 3862.00 2138 | 3871.90 2110 | |
| | | | | 3888.00 2183 | 3904.95 1986 | Creek. |
| 3906.90 | 2020.0 | 62.45 | 7805 | uniform rise. | 3953.10 2256 | Creek. |
| 3986.00 | 2408.0 | 64.30 | 7315 | 4028.20 2537 | 4038.40 2464 | Line between Cam- |
| | | | | | 4039.90 2461 | bria and Blair cos. |
| 4059.60 | 2564 | 118.00 | 20775 | 4054.95 2596 | 4087.00 2297 | |
| | | | | 4064.50 2570 | 4101.85 1992 | Head of Creek. |
| | | | | 4092.10 2233 | 4122.15 1722 | |
| | | | | | 4126.30 1663 | Creek. |
| | | | | 4124.25 1729 | 4133.35 1606 | Creek. |
| | | | | 4142.85 1642 | 4146.50 1627 | |
| | | | | 4150.00 1637 | | |
| | | | | 4154.90 1607 | 4161.30 1390 | |
| | | | | | 4181.20 1304 | Creek. |
| | | | | | 4237.45 1175 | Creek. |
| | | | | | 4249.00 1154 | Creek 15' wide. |
| | | | | | 4256.50 1149 | |
| | | | | 4261.10 1175 | 4272.30 1126 | |
| 4287.20 | 1198 | 88.00 | 4605 | 4275.00 1138 | 4282.50 1118 | |
| | | | | 4293.80 1248 | 4297.75 1222 | |
| | | | | 4301.25 1246 | | |
| | | | | 4310.95 1242 | 4322.90 1067 | |
| 4344.00 | 1044.6 | | BM. | M. Div. = 1056.8 | Error = 0'.4. | |

MIDDLE DIVISION.

BM. = 1057.2

| | | | | | | | | |
|--------|---------|----------------------|--------|--------|-------|-----------|-------|-----------------|
| O.MD | 1044.6 | 110 ⁰ .45 | 11450' | 31.40 | 1089' | 34.15 | 1053' | |
| | | | | 73.63 | 1102 | 37.15 | 1053 | Creek. |
| | | | | 100.87 | 1158 | 94.75 | 1130 | Creek. |
| | | | | | | 101.60 | 1154 | Creek. |
| | | | | | | 107.50 | 1201 | Creek. |
| 115.38 | 1328.6 | 75 ⁰ .45 | 7710' | 118.82 | 1415 | 124.09 | 1507 | |
| | | | | 137.48 | 1927 | 140.19 | 1974 | |
| | | | | 156.48 | 2412 | Summit of | | W. Brush Mt. |
| 199.48 | 1731.5 | 71 ⁰ .30 | 7190' | 205.98 | 1708 | 219.00 | 1327 | Run. |
| | | | | | | 240.90 | 1114 | Sinking Valley. |
| 273.93 | 1104.5 | 132 ⁰ .35 | 4920' | 288.04 | 1107 | 300.40 | 1046 | |
| | | | | 313.02 | 1159 | 316.10 | 1141 | |
| 323.42 | 1192.79 | 127 ⁰ .15 | 28790' | | | 333.60 | 1272 | Run. |
| | | | | | | 340.40 | 1347 | Run. |
| | | | | | | 343.59 | 1395 | |
| | | | | 349.34 | 1667 | 362.56 | 1843 | |
| | | | | 374.51 | 2240 | Summit of | | E. Brush Mt. |
| | | | | | | 415.76 | 1168 | Canoe Creek. |
| | | | | 456.98 | 1862 | 460.84 | 1835 | |
| | | | | 470.02 | 1907 | 475.47 | 1903 | |
| | | | | 478.60 | 1940 | Summit of | | Canoe Mt. |
| | | | | | | 485.69 | 1667 | |
| | | | | 496.09 | 1530 | 504.76 | 1249 | |
| | | | | 507.13 | 1229 | 518.00 | 1083 | Run. |
| | | | | 521.09 | 1136 | 537.28 | 1039 | |
| | | | | 550.88 | 1013 | 553.00 | 923 | |
| | | | | 504.67 | 1012 | 578.14 | 835 | Creek. |
| | | | | 582.10 | 882 | | | |
| | | | | 587.43 | 927 | 599.00 | 780 | Roaring Run. |
| | | | | | | 601.43 | 746.6 | Juniata River. |
| 619.15 | 821.4 | 140 ⁰ .15 | 34030' | 628.77 | 886 | 635.60 | 740 | |
| | | | | 670.60 | 1340 | | | |
| | | | | 672.70 | 1364 | 675.00 | 1345 | |
| | | | | 680.40 | 1493 | | | |
| | | | | 695.40 | 1907 | Summit of | | Tussey Mt. |
| | | | | 715.97 | 1266 | 721.38 | 1259 | Creek. |
| | | | | | | 740.49 | 1650 | |
| | | | | 756.61 | 2296 | | | |
| | | | | 765.95 | 2328 | Summit of | | Tussey Mt. |
| | | | | | | 780.00 | 2178 | |
| | | | | 782.24 | 2189 | 799.35 | 1787 | |
| | | | | 805.68 | 1707 | 825.85 | 1143 | |
| | | | | | | 844.00 | 936 | |
| | | | | 856.37 | 897 | 863.05 | 813 | |
| | | | | 867.79 | 920 | 882.24 | 791 | Run. |
| | | | | 888.07 | 862 | 892.40 | 794 | Run. |
| | | | | | | 905.00 | 772 | |
| | | | | 910.20 | 868 | 915.60 | 772 | |
| | | | | 921.54 | 868 | 925.00 | 827 | |
| | | | | 930.82 | 872 | | | |

NOTE.—From Δ 975.12 there appears to be a constant error amounting to 161' at B.M.; this error should be distributed uniformly—as from tests the variation is constant and uniform.

| | | | | | | | | |
|----------------|--------------------------|-------------|---------------|--|---|--|--|---|
| 961.37 127 | 672.6 See note below. | 161.15 0 | 8530' low. | * 975.12 | 666' | 962.75 1007.46 1013.08 1031.60 1037.53 | 650' 660 630 773 844 | Creek. Creek. |
| 1052.28 | 1072 | 138.45 0 | 37040' | 1035.43 1047.14 | 849 1137.6 | Summit of 1067.40 1090.38 1126.00 1141.24 1147.70 1163.04 1184.00 1197.90 1213.20 1256.90 | 650' 660 630 773 844 | Pine Ridge. Creek. Run. |
| | | | | 1074.80 1121.55 1132.88 1144.60 1156.30 1176.10 1190.50 1205.70 1219.50 1285.04 | 860 993 1016 1022 1193 1254 1082 1005 819 1684 | Summit of 1301.40 1313.44 1355.60 1371.22 Summit of 1413.37 1425.10 1461.80 1474.70 1481.80 1523.36 Summit of 1552.50 1564.70 1582.80 1591.80 1636.10 1652.10 1657.60 | 752 769 910 912 1013 1050 1019 886 762 625.3 | Creek. Creek. Terrace Mt. |
| 1429.05 | 956 | 140.20 0 | 26375' | 1304.30 1320.50 1368.10 1391.75 1403.50 | 1473 1419 1364 1652 1224 | Summit of 1413.37 1425.10 1461.80 1474.70 1481.80 1523.36 Summit of 1552.50 1564.70 1582.80 1591.80 1636.10 1652.10 1657.60 | 1430 1412 1250 1325 Summit of 1100 909 950 924 803 1269 Summit of 1653 1631 1582 1513 1424 1109 1076 | Little Trough Cr'k. Sideling Hill. Creek. Creek. Creek. Creek in Hares' Val. |
| | | | | 1450.92 1469.20 1495.20 1541.00 | 1242 1054 871 1840 | Summit of 1552.50 1564.70 1582.80 1591.80 1636.10 1652.10 1657.60 | 1269 1631 1582 1513 1424 1109 1076 | Jacks Mt. |
| 1695.74 | 987 | 182.30 0 | 11130' | 1556.00 1575.00 1585.50 1611.10 1637.80 | 1682 1776 1564 1726 1402 | Summit of 1552.50 1564.70 1582.80 1591.80 1636.10 1652.10 1657.60 | 1036 741 | Creek. Creek. |
| 1815.70 | 736 | 155.45 0 | 27700' | 1668.70 1697.80 1787.54 | 1083 964 759 | Summit of 1552.50 1564.70 1582.80 1591.80 1636.10 1652.10 1657.60 | 1036 741 | Creek. Creek. |
| | | | | 1883.10 1930.00 1937.60 1966.00 1990.10 2023.70 | 790 1022 1010 691 692 751 | Summit of 1552.50 1564.70 1582.80 1591.80 1636.10 1652.10 1657.60 | 660 670 960 640 708 725 726 | Gt. Aughwick Cr. |
| 2130.44 127 | 830 See note below. | 149.00 0 | 26690' | 2211.50 2245.40 2304.70 2325.40 2364.10 | 870 903 1094 1121 1105 | Summit of 1552.50 1564.70 1582.80 1591.80 1636.10 1652.10 1657.60 | 835 890 910 1095 1097 1111 1105 1132 1162 | Orbisonia. Rock Hill Gap. Creek. Creek 20' wide. Creek. Creek. |
| | | | | 2442.90 2469.10 | 1150 1167 | Summit of 1552.50 1564.70 1582.80 1591.80 1636.10 1652.10 1657.60 | 1162 | Creek. |

If the line be run directly across the mountains on the course 149° it will give the following Maxima and Minima (approximately.)

| Line across the Mts. from | | | | | | | | |
|---------------------------|------|---------|--------|--------------------------------|-------|-------------|-------|----------------------|
| | | | | 2200.00 | 1770' | 2150.69 | 842' | |
| | | | | 2290.00 | 1340 | 2216.20 | 1325 | |
| | | | | 2258.00 | 1160 | 2247.00 | 1020 | |
| | | | | 2300.00 | 1530 | 2266.50 | 1070 | |
| | | | | | | 2312.00 | 1380 | |
| | | | | | | 2322.00 | 1300 | |
| | | | | 2328.00 | 1340 | 2337.50 | 1328 | |
| | | | | | | 2342.00 | 1260 | |
| | | | | 2360.00 | 1500 | 2377.60 | 1180 | |
| | | | | 2385.00 | 1220 | 2475.77 | 1162 | Creek. |
| 2475.77 | 1162 | 136.15' | 13230' | | | 2489.40 | 1249' | |
| | | | | 2519.10 | 2060' | 2503.00 | 1518 | |
| | | | | | | 2531.20 | 1601 | |
| 2618.81 | 1002 | 115.15' | 7750' | 2645.00 | 976 | 2561.20 | 1200 | Creek. |
| 2697.30 | 1040 | 79.00' | 2550' | 2681.00 | 1002 | 2674.20 | 945 | |
| 2723.20 | 947 | 92.30' | 8930' | 2737.70 | 1023 | 2694.00 | 1030 | |
| | | | | 2758.20 | 1224 | 2751.70 | 1180 | |
| | | | | 2797.00 | 2020 | 2764.80 | | Creek. |
| 2826.87 | 1710 | 119.00' | 17080' | 2864.00 | 1397 | Kitta tinny | | Mountains. |
| | | | | 2876.30 | 1360 | 2868.60 | 1250 | |
| | | | | | | 2894.30 | 1377 | |
| | | | | | | 2916.80 | 1258 | |
| | | | | 2920.80 | 1272 | 2942.10 | 949 | Conodogwinet Cr. |
| | | | | 2944.00 | 1030 | 2952.00 | 942 | ditto. |
| 3028.47 | 895 | 120.55' | 22720' | 3090.80 | 844 | 3108.90 | 844 | |
| | | | | 3111.73 | 865 | 3139.00 | 768 | |
| | | | | 3146.50 | 849 | 3151.00 | 810 | Creek. |
| | | | | 3164.80 | 855 | 3175.40 | 750 | Creek. |
| | | | | 3193.00 | 824 | 3229.30 | 700 | Conodogwinet Cr. |
| | | | | 3260.80 | 844 | | | |
| 3266.41 | 840 | 125.00' | 21320' | 3305.30 | 780 | 3348.50 | 873 | [Cumberl'd Cos. |
| | | | | 3400.00 | 885 | 3435.70 | 849 | Line of Franklin and |
| | | | | 3458.80 | 835 | 3464.00 | | Shippensburg. |
| 3499.28 | 821 | | | 3499.30 | 821 | | | |
| | | | | BM. E. Div. = 821. Error 161'. | | | | |

EASTERN DIVISION.

| O B M | | | | | | | | |
|---------|------|---------|--------|--------|------|--------|------|-------------------|
| 659.333 | | 133.35' | 13720' | | | 1140 | 651 | |
| | | | | 24.00 | 699' | 33.50 | 671 | |
| | | | | 45.70 | 744 | 54.00 | 707 | |
| | | | | 63.50 | 814 | 79.00 | 725 | |
| | | | | 117.30 | 773 | | | |
| | | | | 140.00 | 818 | | | |
| 147.00 | 856 | 133.50' | 34830' | 188.00 | 988 | 207.00 | 1450 | |
| | | | | 211.50 | 1305 | 240.00 | 1130 | Creek. |
| | | | | 261.50 | 1568 | 278.00 | 1340 | |
| | | | | 348.50 | 1914 | 364.50 | 1861 | |
| | | | | 379.50 | 1953 | 391.50 | 1718 | Creek. |
| | | | | 396.00 | 1800 | 401.00 | 1718 | |
| | | | | 423.00 | 1914 | 427.50 | Line | [Adams. |
| | | | | | | 452.00 | 1425 | between Cumb. and |
| | | | | 477.00 | 1047 | | | Creek. |
| | | | | 492.00 | 1657 | | | |
| 496.50 | 1635 | 109.30' | 7035' | | | 523.00 | 1236 | Creek. |
| | | | | 531.00 | 1282 | 555.50 | 1113 | |
| 567.00 | 1112 | 109.30' | 6880' | 574.30 | 1102 | 622.00 | 825 | |
| 636.00 | 863 | 138.10' | 26670' | | | 660.00 | 732 | Conewago Creek. |

240 N. REPORT OF PROGRESS. CHARLES ALLEN.

| | | | | | | | | |
|---------|-------|--------|-------|---------|------|---------|------|--------------------|
| | | | | 721.00 | 812 | 767.00 | 705 | Creek. |
| | | | | 773.80 | 766 | | | |
| | | | | 816.50 | 786 | 829.00 | 673 | |
| | | | | 838.15 | 728 | 877.65 | 671 | |
| | | | | 886.50 | 643 | 889.20 | 666 | |
| | | | | 895.25 | 616 | | | |
| 917.37 | 630 | 141.20 | 21700 | 928.50 | 654 | 938.00 | 613 | |
| | | | | 955.00 | 666 | 972.20 | 668 | |
| | | | | 987.50 | 624 | 1015.00 | 575 | |
| | | | | 1040.70 | 636 | 1055.00 | 525 | |
| | | | | | | 1069.75 | 495 | Creek. |
| | | | | 1077.50 | 537 | 1082.35 | 517 | |
| | | | | 1086.50 | 533 | 1091.50 | 496 | |
| | | | | 1095.00 | 514 | 1103.00 | 495 | |
| | | | | 1108.00 | 507 | 1114.60 | 489 | |
| | | | | 1120.00 | 496 | 1142.00 | 461 | Strikes Rock Creek |
| 1145.00 | 460 | 175.30 | 10950 | Run | ning | along | Rock | Creek. |
| 1256.00 | | 155.30 | 13920 | 1261.00 | 480 | 1275.00 | 448 | |
| | | | | 1284.00 | Leav | es | Rock | Cr |
| | | | | 1303.00 | 472 | 1313.50 | 550 | eeek. |
| | | | | 1330.50 | 568 | 1333.00 | 442 | |
| | | | | | | 1351.00 | 442 | |
| | | | | 1363.00 | 509 | 1383.60 | 414 | White Run. |
| 1397.18 | | 126.40 | 22300 | 1427.50 | 531 | 1432.50 | 508 | |
| | | | | 1438.50 | 528 | 1443.00 | 506 | |
| | | | | 1447.00 | 522 | 1450.00 | 506 | |
| | | | | 1458.00 | 538 | 1462.25 | 528 | |
| | | | | 1468.00 | 535 | 1472.00 | 533 | |
| | | | | 1479.00 | 497 | 1482.50 | 514 | |
| | | | | | | 1492.40 | 482 | Creek. |
| | | | | 1499.00 | 524 | 1533.00 | 525 | Creek. |
| | | | | 1558.00 | 587 | 1582.00 | 510 | Creek. |
| 1621.27 | | 136.30 | 28680 | 1606.30 | 584 | | | |
| | | | | 1658.20 | 524 | 1626.80 | 515 | Creek. |
| | | | | 1691.40 | 611 | 1679.70 | 564 | |
| | | | | 1714.97 | 641 | 1696.70 | 585 | |
| | | | | 1735.70 | 604 | 1718.50 | 632 | |
| | | | | 1758.10 | 615 | 1746.20 | 551 | |
| | | | | 1778.41 | 596 | 1776.20 | 547 | Creek. |
| | | | | 1829.70 | 706 | 1788.40 | 574 | |
| | | | | 1856.00 | Line | bet. | Penn | a. and Maryland. |
| | | | | | | 1851.93 | 605 | |
| | | | | | | 1884.70 | 638 | |
| 1926.16 | 755 | 137.00 | 29140 | 1907.70 | 731 | | | |
| | | | | 1943.50 | 735 | 1937.70 | 693 | |
| | | | | 1952.70 | 666 | 1954.25 | 618 | |
| | | | | | | 1972.70 | 582 | Creek. |
| | | | | 2013.70 | 790 | 2022.70 | 700 | |
| | | | | 2025.70 | 707 | 2027.20 | 686 | |
| | | | | 2029.70 | 724 | 2031.20 | 700 | |
| | | | | 2048.70 | 792 | 2059.70 | 667 | |
| | | | | 2069.00 | 789 | 2092.00 | 603 | |
| | | | | 2095.70 | 716 | 2110.70 | 576 | Creek. |
| | | | | 2120.70 | 762 | 2125.70 | 720 | |
| | | | | 2129.25 | 746 | hollow | | |
| | | | | 2147.70 | 718 | 2150.20 | 683 | |
| | | | | 2164.20 | 698 | 2166.70 | 657 | |
| | | | | 2171.20 | 673 | 2182.45 | 587 | Creek. |
| | | | | | | 2186.70 | 593 | Creek. |
| | | | | 2189.70 | 684 | 2196.70 | 607 | Creek. |
| | | | | 2197.25 | 620 | | | |
| 2227.70 | 706.3 | 137.30 | 9775 | 2242.70 | 725 | 2229.50 | 680 | |
| | | | | 2256.70 | 745 | 2252.70 | 676 | Creek. |

| | | | | | | | | |
|---------|--------|--------|------|---------|------|-------------|-----|---------------------|
| | | | | 2264.70 | 755 | 2269.70 | 726 | |
| | | | | 2274.00 | 742 | 2281.70 | 674 | |
| | | | | 2288.70 | 751 | 2291.70 | 730 | |
| 2328.70 | 188.30 | 7150 | | 2297.70 | 767 | 2311.70 | 678 | Creek. |
| | | | | 2330.20 | 797 | 2340.70 | 739 | |
| 2405.08 | 152.05 | 27870 | | 2369.70 | 880 | 2382.70 | 795 | |
| | | | | 2396.70 | 826 | | | |
| | | | | 2443.70 | 861 | 2418.70 | 732 | Creek. |
| | | | | 2471.45 | 914 | 2452.20 | 776 | |
| | | | | 2481.00 | 971 | 2492.20 | 870 | |
| | | | | 2504.70 | 891 | | | |
| | | | | 2508.45 | 906 | | | |
| | | | | 2523.70 | 874 | 2532.70 | 819 | |
| | | | | 2540.70 | 843 | 2543.70 | 834 | |
| | | | | 2563.70 | 864 | 2576.20 | 803 | |
| | | | | 2585.35 | 813 | 2598.70 | 814 | |
| | | | | | | 2632.70 | 738 | |
| | | | | 2644.30 | 780 | 2652.70 | 757 | |
| | | | | | | 2662.70 | 717 | |
| | | | | 2676.70 | 735 | | | |
| 2697.70 | 152.00 | 26340 | | 2696.70 | 743 | | | |
| | | | | 2722.70 | 733 | 2702.20 | 707 | |
| | | | | 2732.70 | 685 | 2727.70 | 650 | |
| | | | | 2742.20 | 649 | 2745.20 | 585 | |
| | | | | 2747.70 | 620 | | | |
| | | | | 2752.70 | 644 | 2762.70 | 489 | E. Br. Patapsco. |
| | | | | 2785.70 | 652 | 2798.20 | 530 | Run. |
| | | | | 2799.70 | 541 | 2802.45 | 461 | Deep Run. |
| | | | | 2810.00 | 520 | | | |
| | | | | 2812.70 | 534 | 2820.70 | 467 | |
| | | | | 2831.70 | 612 | 2838.70 | 464 | |
| | | | | | | 2841.70 | 461 | |
| | | | | 2846.70 | 529 | 2849.00 | 501 | Creek. |
| | | | | 2855.20 | 604 | 2859.70 | 557 | |
| | | | | 2865.70 | 590 | 2867.70 | 544 | |
| | | | | 2879.70 | 572 | 2885.70 | 552 | |
| | | | | | | 2886.70 | 511 | |
| | | | | 2888.70 | 540 | 2908.00 | 429 | Great Run. |
| | | | | | | 2916.70 | 453 | |
| | | | | 2923.00 | 526 | 2924.70 | 467 | |
| | | | | 2928.20 | Line | of Car roll | | [ties. |
| | | | | 2929.00 | 532 | 2938.10 | 499 | and Baltimore coun- |
| | | | | 2943.70 | 581 | 2944.70 | 508 | |
| | | | | 2949.70 | 519 | 2951.45 | 473 | |
| | | | | 2954.70 | 537 | 2957.70 | 509 | |
| | | | | | | 2959.70 | 469 | |
| | | | | 2976.30 | 584 | | | |
| 2981.60 | 522 | 190.30 | 9460 | 3047.10 | 574 | 3053.00 | 475 | |
| | | | | | | 3058.70 | 474 | Creek. |
| | | | | 3068.70 | 541 | 3070.70 | 532 | |
| 3077.06 | 189.45 | 9040 | | 3077.00 | 606 | 3078.00 | 593 | |
| | | | | 3085.20 | 642 | 3086.70 | 626 | |
| | | | | 3090.70 | 633 | | | |
| | | | | 3099.30 | 634 | 3113.70 | 556 | Creek. |
| | | | | 3123.70 | 605 | 3143.45 | 568 | Run. |
| | | | | 3151.00 | 671 | | | |
| | | | | 3163.30 | 688 | 3169.70 | 626 | |
| | | | | 3173.70 | 639 | 3187.70 | 536 | |
| 3188.50 | 533 | 167.00 | 9170 | | | 3191.70 | 511 | Creek. |
| | | | | 3204.10 | 613 | | | |
| | | | | 3210.70 | 647 | 3215.20 | 625 | |
| | | | | 3226.40 | 683 | 3237.00 | 600 | |
| | | | | 3241.20 | 620 | 3248.20 | 537 | |

The Seaboard Pipe Line survey commences in the Oil Region of Western Pennsylvania, in the Valley of the Allegheny River, at a point one and a half miles below (south of) Monterey Station, on the Allegheny Valley Railroad; takes a nearly straight course over the high lands of Indiana and Cambria counties; descends the face of the Allegheny Mountain; crosses the mountain and valleys of Middle Pennsylvania; the South Mountain range; the red sandstone plain in front of them, and the hills of Middle Maryland to Baltimore; a total distance of about 228 miles, = 1,202,828 feet.

It passes about fourteen miles south of the county town of Indiana; one mile south of Carrollton, in Cambria county; crosses the Pennsylvania Railroad at Elizabeth Furnace; the Broad Top Railroad at McConnellstown; passes through Orbisonia, Shade Gap, Roxboro', Shippensburg, Gettysburg; passes one mile south of Littlestown; two and a half miles south of Westminster; one mile south of Reistertown; follows the Ridge between Patapsco Falls and Guyron's Falls, and terminates on Curtis' Bay, two miles south of Canton, on an inlet of Chesapeake Bay at Baltimore.

REMARKS.

In the column marked \triangle the distance from starting points B M are given in feet, measured on the ground, (not horizontally.)

The elevation is given in the second column in feet and hundredths.

NOTE.—the decimal point in the 1st, 5th, and 7th columns divides the distance into lengths of 100 feet. Thus: 98.35=9,835 feet, &c.

The courses given in the second column show the general direction. The line run varies from the general direction in many places, but is seldom more than from one to two hundred yards to right or left of the general course, and in most cases less.

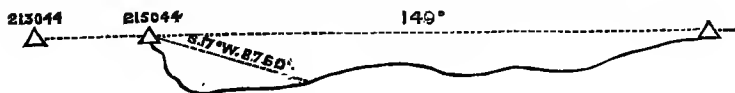
The distances in the fourth column are the distances of a number of shorter courses taken by scale from the plot.

The columns of Maxima and Minima give the undulations, being ordinates at extreme elevations and depressions, or where there are changes in the slope of the ground.

Any further information desired may be obtained from B. F. Warren, 734 N. 20th street, Philadelphia.

The degrees and minutes of courses begin with 0° at north, running $90^\circ = E$; $180^\circ = S$; $270^\circ = W$, &c.

† From 2150.44 the line follows the general direction of the road through Shade Gap, and diverges considerably from a straight line, thus:



REPORT OF PROGRESS N.

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NOTE.—Stations in the States of New York, New Jersey, Maryland and Ohio are so marked, to distinguish them from places within the limits of Pennsylvania bearing the same names.

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